3303

THE VETERINARY JOURNAL
AND
Annals of Comparative Pathology.

JULY, 1884.

ACTINOMYCES IN SWINE-FLESH.*

BY H. C. J. DUNCKER, BERLIN.

My interest was greatly aroused when I learned to recognise dead trichinæ in pork, as first described by Leuckart; and it was not diminished when I found that the percentage of trichinous swine seemed ever to increase; in which, in addition to normal trichinæ, there were unhealthy-looking or dead ones. Continued observation led to the opinion that the death of the parasites did not result from any disturbance in the general nutrition of the body, but that we had to do with a peculiar disease of the trichinæ, perhaps dependent upon an unknown parasite. I had often observed that the dead trichinæ within the capsules gradually became broken up into small pieces, and that the process of calcification extended o the capsule, which became thick and opaque. Such bodies are with difficulty distinguished from the ordinary calcareous concretions met with in pork; indeed, the existence of remnants of the parasite, or the presence of other less altered worms in the flesh, will alone, in some instances, enable a determination of their nature to be made. In my present position as manager of the control-station of the Bureau of Inspection of the City Abattoir, I have had unusual opportunities for pursuing an inquiry into the subject, and have made some interesting obser-

* So much interest has been aroused in this subject by the communication of Herr Duncker, and by the article of Virchow in a recent number of his *Archiv*, that I requested Herr Duncker to let me present his views to English readers, and he kindly re-wrote the article, of which this is a translation.—W. OSLER, M.D., *Montreal Veterinary College.*

vations, which have been published in the *Zeitschrift f. Mikroscopie und Fleischau.** And, first, a few words upon the forms of concretions in swine-flesh. Any one who has studied these bodies must have remarked that they are not always of the same appearance. They can usually be recognized with the naked eye, as single opaque white spots, or in rows along the course of fibres, in the interspaces of which they appear to be imbedded (Fig. 1). In

Fig. 1.

other instances, they are larger and more scattered. Both forms, in their finer details, are of very similar structure, but our interest here lies chiefly with the first. To get them isolated requires careful work, as they break very easily. When successfully teased out, they appear as round, oval, or bean-shaped bodies, thin in the middle, and with prominent borders, which in many instances are striated, or present a ray-like arrangement. The diameter ranges from 0·10 to 0·20 of a millimetre. In spite of all possible care, I was not able for a long time to determine the nature of these bodies; but at last I came to the conclusion that they were calcified actinomyces tufts. On the 11th of January of this year, one of the Inspectors called my attention to the flesh of a measly pig, which contained, in addition, a remarkable number of dark-looking muscle fibres. As I had never seen this form of muscle degeneration so marked, I procured more of the flesh, in order to prepare specimens for the histological collection of the abattoir. The preparations showed between the normal muscle fibres others very irregular in form—broken, granular, and of a dirty-brown colour; and within the sheaths of these, at variable distances, there were well-defined dark bodies of the shape of coffee-beans. With a power of 150 diameters, they appeared radially striated. With 650 diameters, the affected

* Verlag E. Hopf, in Spandau, Berlin, No. 3, 1884, in which the first communication upon actinomyces in pork appeared.

fibres were found to contain muscle *débris*, oil droplets, and a great number of fine micrococcus-like granules, in tremulous motion; and it then occurred to me that the dark bodies within the sarcolemma had a certain similarity to tufts of the actinomyces. Naked-eye examination of the flesh revealed the course of the degenerated fibres by their colour, and also the bead-like arrangement of the calcareous bodies in them, as shown at Fig. 1. Further microscopic study of the affected fibres showed that, here and there, portions of the muscle substance could be distinguished, but the aggregations of micrococcus-like granules (often to the extent of distending the sarcolemma) and the dark bodies above described, were the most characteristic features. The latter were determined to consist of highly refractile, well defined, club-shaped mycelia, centrifugally arranged, more closely compressed, and not so distinct as the tufts of actinomyces in the tumours of the jaw in cattle. With cochineal they became still better marked. The proper solution is made by adding to water, acidulated with acetic acid, enough of an alcoholic solution of cochineal to give a pale-red colour. In this, small bits of the muscle colour well in eight or ten hours, while the actinomyces become more deeply stained. Although the freshly-prepared specimens show very clearly, they do not keep well, as the contours of the mycelia become indistinct. On showing the preparations to Dr. Oscar Israel, one of Professor Virchow's assistants, who had been studying the development of this fungus, he remarked on the same difficulty which he had in his culture experiments. The tufts appear to have a very slight power of resisting reagents, and, according to Dr. Israel, the rapid changes seem to be due to a process of imbibition. This case, although it left many points unexplained, proved that swine flesh was sometimes infested with actinomyces, and that the calcified tufts were not to be distinguished, macroscopically, from the ordinary calcareous concretions, a microscopic examination being necessary to determine between them. From previous observations I knew that this condition was by no means uncommon, and I demonstrated the specimens to the staff of inspectors at the abattoir, in order that they might be readily able to select suspected portions. The result was most satisfactory; for in more than

twenty cases the fungus has been discovered. The power used by the ordinary inspectors in examining the muscle for trichinæ is only fifty diameters, and does not suffice to do more than determine the presence of numerous degenerated fibres, or the calcified bodies within the sarcolemma. In these animals I have been fortunate enough to trace the development of the fungus, and the pathological changes which accompany its growth.

I had not intended making a preliminary communication ; but as Professor Johne, of Dresden (who had seen one of my preparations, taken from a not very typical case, and which had probably undergone the changes above-mentioned), has on several occasions stated that the fungus described by me is not actinomyces, I shall here briefly refer to my additional observations. The fungus is most commonly found in the abdominal muscles, the hams, the intercostals, and the diaphragm. In the ham muscles as many as twenty per cent. of the fibres are sometimes affected, and the meat appears turbid and watery. The first appearance of the fungus can be recognised by the peculiarly irregular contour of the affected fibres, and with high powers one sees at this time the appearance of an intense interstitial inflammation of the muscle, and within the sarcolemma, between the individual fibrils, innumerable micrococci. Gradually, with an increase in inflammation, the substance becomes more and more affected, not in the entire length of the fibre, but here and there bulging occurs from the accumulation of micrococci and of the mycelia, which soon make their appearance. The branches of the mycelia appear to grow from the closely-set coccus-like aggregations, and they have the characteristic club-shaped extremities. Sometimes only the bulbous ends of the tuft can be seen, or one, perhaps, projects beyond the others. In some of them I have been able to see at the ends divisions, as if gonidia were in process of formation. The later stage of the process is the shrinkage of the mycelia, and its impregnation with lime salts. As in *A. hominus* and *bovis*, the *Actinomyces suis* does not always display the club-shaped mycelia, particularly if the affection is in an early stage. The calcification appears to supervene pretty rapidly, and compresses the tufts. When this has taken place, the application of acids does not render the fungus apparent.

The encapsulation of the hard concretions takes place in the same way as the trichinæ. In conjunction with Dr. Hertwig, veterinary superintendent, animals have been inoculated, and cultivation experiments instituted, which are expected to yield interesting results.

In conclusion, two questions arise:—(1) How does the presence of the actinomyces affect the living swine? and (2) What significance has the fungus for the practical meat inspector? The first of these questions must be solved by the veterinary surgeons; the last—here in Berlin, at least—has received its solution, inasmuch as the carcases of swine which are much affected are consigned to the knacker.

SINGULAR CASE OF RABIES IN A DOG.

BY E. M. DAVY, M.R.C.V.S., ABBEY ROAD, LONDON.

ON Monday morning, April 28th, I was requested to call in the neighbourhood to see a fox-terrier dog, about two years old, and bred by the owner, which, I was informed, had completely bitten his tail off during the previous night. On arriving at the house I ascertained that the dog was still shut up in his kennel in the garden. I went out to it, and, much to my surprise, I found that the information I had received was perfectly correct, and nothing of the tail (which was about six inches long) remained. The dog answered to his name on being called, and seemed to wish to be noticed. My client was desirous that I should have him in my infirmary, and as I anticipated I had a case of Rabies to deal with, I took every precaution in removing him. During that and following days he continually tried to vomit, but unsuccessfully; he drank water freely, and ate a little bread and gravy. The following day (Tuesday) there were no further symptoms; but on Wednesday, when his box was being cleaned, he viciously caught hold of the broom, but beyond that there was no change.

He continued to eat and drink, and his motions were natural. On Thursday afternoon a stick was used instead of the broom, and he again flew at that, yet still continued to eat and drink a

little; but during the night he bit the woodwork of his box, and on Friday morning died, without having shown any further symptoms.

On making a *post-mortem* examination (at which Professor Axe, of the Royal Veterinary College, was present), I found every indication of Rabies.

I may add that this dog did not once give the well-known and distinctive howl of a rabid dog; also, that I carefully examined his kennel, which had not been touched since his removal, and could find no trace of his tail, with the exception of a few blood-stains.

I send particulars of this case for notice, thinking it is a very singular one.

VETERINARY REPORT ON BENARES.

BY VETERINARY SURGEON R. W. BURKE, M.R.C.V.S., A.V.D., BENARES.

THE district of Benares constitutes part of the alluvial valley deposited by the river Ganges. Its surface, which is made up of a rich clay, more or less mixed with loam, blue tilt, and reddish sand, consists of a level plain, with a gentle upward slope on each side from the central depression, and watered by the Berna in the west, the Nand river in the north, the Gumti, which runs through the district for a course of some twenty-two miles (joining the Ganges at about sixteen miles below the city), and the Karamnasa in the south-east border—the latter often subject to sudden flushes, which produce considerable inundations, especially after the rains, but remaining almost dry during the hot months. The Berna would also run dry in the cold weather, and during the early summer months, were it not prevented by a dam thrown across it about a mile before its confluence with the Ganges. Three small *jhils*, or marshy lakes, are to be found in the northern land, the malaria from which, during the dry, hot months, is very productive of febrile diseases, and, in the human subject, Cholera. The bottom of the three smaller streams—excepting the Karamnasa in the south-east—is also naturally filthy, and particularly offensive when allowed to dry under the rays of a strong sun during the hot months, and must, therefore, tend to the propaga-

tion of disease from deleterious emanations. A few patches of barren land (saline efflorescence), called by the natives *usár*, occur here and there; otherwise the district is constituted by an almost wholly cultivated land, abundantly irrigated, and usually very fertile. This variety of soil (*usár*) is not so tenacious of moisture, and unless it receives abundance of irrigation, is not very productive. The inferiority of soil in some parts is attributable to the fact that, being of a more sandy composition, it retains moisture for a shorter time. The only stone found is *kunkur*.

2. Altogether Benares does not form the most favourable receptacle for the location of Government animals—the *genus homo* not excluded! The climate is hot and moist, and skin disorders of a somewhat obstinate and peculiar character, from hyperaction of that covering, are not uncommon, especially Prurigo, Erythema, "Bursatti," and specific Ptyriasis, which will be shortly described by me on another page. The temperature more nearly resembles that of Lower Bengal than that of the upper country beyond Allahabad or North-west Provinces. I paid a flying visit to Benares, on casting duty, in December last, and the temperature then, as well as I remember, was low —60°. In February, on completion of special duty at Allahabad as inspector of animals returning from Egypt, I assumed veterinary charge of the battery in Benares, and the thermometrical readings from that time to March ran from 62° to 79°, when there was a slight rise noticed towards the latter part of April, viz., to 87°, to 92° in May, June, and July, August 90°, September 86°, and October 80°.

The hot east winds blow during April and May, and sometimes till later, and were the cause, as I believe, of a few cases of "Granular Ophthalmia" in horses, that occurred during the early part of my veterinary charge of G/1 Royal Artillery in Benares.

These winds also retard the process of repair in wounds, by exciting pus formation.

The course and termination of previously weakened or diseased tissues, as the result of inflammation, as also febrile disorders, asthenic states of the system generally, etc., are moreover materially influenced by the prevalence of the latter; and it is even surmised that the production of *kumree* (Specific Paraplegia

of the horse) is sometimes referable to the same cause, although to my mind, this phase of the etiology of the disease would appear doubtful.

The action of blisters during these winds is considerably heightened; one to sixteen parts of Cantharides being about equivalent to one to six employed in colder climates. Further, an aperient is about equal to a purgative at home. Sedatives require to be used with even greater caution, and in smaller doses.

3. No Government stud operations are carried on in or near Benares. The ordinary country-bred horse, of an inferior type, having a coarse body, weak hocks, round in the buttocks, bad shoulders, narrow-chested, and nearly always "running to leg," common to Lower Bengal, is also to be met with in this neighbourhood. The only place where horse-fairs are annually held is Bălyâh, situated some fourteen miles down the Ganges, beyond Ghazipur.

No parasitic diseases have come under my notice since I have held veterinary charge at Benares, excepting the *Tinea tonsurans*, of which we had a few cases.

4. The grasses to be obtained in this district are "dhoob" and the other shorter grasses abundant during the monsoons, lucerne and guinea-grass, specially cultivated under battery arrangements for the use of the horses. The principal grains are—Barley, wheat, rice, oats, peas, gram, mote, and linseed. Bajrâh, jōâr, Indian corn, and other common food grains are procurable in the autumn. Cotton-seeds are also largely used as food for cattle, and by virtue of the large proportion of oil they contain, prove very nutritious, especially in milch cows. Măsōōr, mōōng, ùrid, and other pulses are also used with a similar object, and when required to fatten animals for the market.

5. The water is obtained from a pukkah well, situated about fifty yards from the centre of the horse lines. Its chemical properties: "Chlorine, free ammonia, nitrous acid, sulphuric acid, nitric acid, zinc, magnesia, and silica—of each a trace. Albuminoids, a small quantity." Common earth is held in solution in variable quantity during the rains.

6. The stabling, constructed in the year 1860, and comprising two rows of buildings placed parallel to each other, affords accommodation for 136 horses; each building is constituted by

two rows of pillars, the distance between the central pillars, transversely, is about six feet, and between the outer and central ones about ten feet. The two outer rows of pillars are built of pukkah masonry; the two central ones of kutcha-pukka masonry. Between the central pillars is a raised platform of rammed earth, a foot high. The flooring of both the stables and outstanding buildings consists of rammed earth with a pukkah drain running along the outer row of pillars. The cubic space allotted to each horse is 800 cubic feet. The ground under the horses forms a bad floor, being made of common earth, and is difficult to keep in proper repair; besides, urine is readily absorbed. I at the first recommended, through the officer commanding, *kunkur* flooring as a substitute; but the Public Works Department considered it much too expensive an undertaking, and therefore refused to adopt my recommendations, on the plea of expense alone. On a subsequent occasion, when I had to report an outbreak (sporadic) of some five cases of Loodianna Disease, or Anthrax Fever, in the battery, I again made strong representations to the officer commanding, with the view to having the floors replaced by *kunkur;* but his efforts proved of no avail, and the floors were renewed by ordinary earth. The roof of stables is low, offers imperfect protection, except from the actual rays of the sun, and there is no roof-ventilation present.

The sick-lines are most unsatisfactory, comprising only four stalls, and continuous with other stalls occupied by healthy horses. In short, there is no separation of the sick from the healthy!

7. The sanitary condition of Benares, in point of natural drainage, is generally good, as there is a fair fall to the rivers, and the surface-water quickly runs off. Water from the stables is carried off by a pukka drain. The manure is collected and allowed to decompose under the heat of the sun, and is then used as a top-dressing for a lucerne bed kept by the battery.

8.

	Gram.	*Bran.*	*Grass, mixed.*
Quantity.—	3-3¼ srs.	1-1¼ srs.	20 srs.
Quality.—	Good.	Moderate.	Fair.

The gram is occasionally a little under weight, otherwise good. Linseed was supplied to certain of the horses at my recommendation by the Commissariat Department. The proportions of gram and bran had to be varied according to the time of year. The gram was crushed, then mixed with bran, and water sprinkled on it, and the whole allowed to soak for the space of about twenty minutes before issue to the horses—ample time for it to "sweeten."

I.—Cases.

Cases of Deaths, showing the post-mortem appearances, taken from the Record of Treatment.

(*a*) Case 39, G 25. *Enteritis.*—Admitted on the 7th April, at 4 p.m.; died the following day, 10.15 a.m.

Post-mortem examination showed the following:—Softening of the mucosa of the intestines, especially of the cæcum and colon; serous exudation into the connective tissue and fibrous band of the colon; liver softened from extravasation; the lungs congested in patches; blood unusually liquid; dark blotches on the buccal membrane. I suspect Anthrax!

(*b*) Case 51, G 72. *Anthrax Fever.*—Admitted on the 4th of May. Died the same day, after an illness of five hours.

Post-mortem examination revealed serous effusions into the abdominal and thoracic cavities; effusions of yellow sero-lymphoid fluid into the connective tissues over various parts of the body, but particularly around the kidneys and about the pelvis generally; the kidneys disintegrated, from bloody extravasation, and the medullary and cortical portions rendered indistinct and presenting a uniform appearance throughout; lungs congested; ramiform injection of the vessels of the visceral peritoneum.

(*c*) Case 52, G 33. *Anthrax Fever.*—Admitted on the 4th of May, along with Case 51; died on the morning of the 7th *idem.*

Post-mortem examination revealed the following:—Presence of general gastro-enteric lesions; softening and disintegration of the intestinal secretory glands, especially of the Peyer's patches, from extravasation; effusion of serum into various parts of the

body, especially into the parenchyma of organs and into loose connective tissues generally; blood unusually thin, and presenting a tarry aspect, from disintegration of its corpuscles.

II.—Diseases.

(*a*) *Prurigo.*—There is a peculiar form of Prurigo in the horse common to the wet season in India, as I must observe, the etiology of which does not seem to be generally understood, but is easily explained, I think, by what is seen to follow the mode of treatment that was adopted by me in these cases. I have prescribed large and alternate doses of calomel, muriatic acid, and sal-ammoniac, with the best results, which leads me to conclude that this affection—in the horse, at least—is sometimes referable to retention of the biliary acids in the system, due to imperfect bilification. There was scarcely a horse in one sub-division of the battery under my veterinary charge at Benares that did not show signs, more or less, of having similarly suffered during the months of June, July, and August, and made it impossible for me to keep a record of them, which recovered under the above course of treatment, on detection of the results following the same in the first case. Symptoms: Itching was among the first symptoms noticeable, particularly in parts previously injured or diseased (instance, *brand-marks* about the neck, on the shoulders, barrel, gluteum, etc.); the vessels of the skin became congested; there was present some amount of heat, supersensitiveness, etc., followed by effusion into the corium, which was either removed by absorption if early treated, or terminated, as it sometimes went on to pus formation, in abscess, and finally burst, giving rise to troublesome ulcers. A frequent accompaniment of this disorder was pallidity of the mucous membranes, and even loss of appetite, impaired digestion, fœtor, and discoloration of the fæces, etc.—symptoms indicative of biliary derangement.

(*b*) *Contagious Impetigo of the Horse.*—I have had but a single opportunity up to the present of dealing with this disease in the equine species, but I am strengthened in my opinion by what has appeared in the descriptions of it by Dr. Tilbury Fox as affecting

man, who has had a very extensive experience, a proof of which is seen in his recent work on "Diseases of the Skin." So rare is this disease that probably few have hitherto seen a well-marked case, at least in the horse. Because a disease is uncommon, it is not, therefore, to be disregarded. There are few diseases, however infrequent, which will not be met with in the future. It is necessary, therefore, to be acquainted with the diseases which are rare, as well as familiar with those which are common.

To attempt to give a detailed account of it would not come within the scope of the present purpose. I shall therefore merely describe the first case, taken from the record of treatment:—

Impetigo Contagiosa Equi.—Reported by the sergeant-farrier as a new "Leg-Disease" among some fifteen horses (inclusive of officers' chargers) of the battery. On examination was found to correspond with the Contagious Impetigo of man described by Dr. Tilbury Fox. Numerous discrete vesicles developed themselves about all four limbs, from the knee and hock downwards, in some cases attended by slight œdema of the surrounding skin, which appeared otherwise healthy, except that it was bedewed with a honey-like discharge that obtained from the vesicles as they burst. This discharge appeared to be of a harmless character, as it did not excoriate the skin over which it passed on escape from the vesicles aforementioned. They were characteristic in appearance, being pearly white, and resembled so many little watery bladders situated under the hair, and seen when the latter was raised by the hand. *They showed no tendency to coalesce, but remained discrete throughout their pathological course.* The eschar which formed during the subsequent stages, on spontaneous rupture of the vesicles, was matted to the hair in a characteristic manner, and appeared to be glued on. In two cases the disease attacked the body in addition to the limbs. The malady, which has hitherto escaped notice in the horse, was seen to be confined to a sub-division of chestnuts only, excepting one horse, which was a roan with white legs; and the officers' chargers, one belonging to Lieut.-Col. Battiscombe, and another, a battery horse ridden by Lieut. Frost, were also both chestnuts! The spread of the disease was clearly by contagion, effected through adjacent

horses—the disease having appeared at one end of the sub-division, thence spreading to the other.

Inoculated Case 54, G 7, on the body with its own exudate, removed from the limbs, with effect, producing characteristic vesicles all round the inoculated area within a few days. The duration of the disease was short—a little over two weeks. Inoculated a dog, with negative results, proving that it is not indigenous in, at least, not communicable to, this animal. Inoculated the same dog thrice, in the interdigital space, on the inner surface of the ear, and lastly in the groin—with no results.

Treatment.—Isolation. Dressings of nitrate of silver and sulphate of copper, and cleanliness—after first clipping the hair of the affected parts by the horse-clipping machine. Physic-medicine was also prescribed in one or two cases, attended by slight pyrexia.

(*c*) *Ptyriasis, Tropical,* or the so-called *Eczema Papulosum* of some practitioners, *Chronic Psoriasis* of others.—Of this there was also a great number of cases among the horses during the past season, of which nineteen of the worst only have been recorded. A brief general description of one of the cases, taken at random from the record of treatment, will here suffice to explain its nature and pathological characteristics.

(*To be continued.*)

FOOT-ROT IN SHEEP.

BY W. PENHALE, M.R.C.V.S., BARNSTAPLE.

THE importance of Professor Axe's discovery as to the cause of "Seedy-Toe" in the horse recorded in *The Veterinarian* for January, is one which cannot, in my opinion, be over-estimated especially when viewed in the light of comparative pathology. It is well known to all of us that some of the lower animals suffer from several very troublesome diseases of the horny covering of the feet, notably that of "Foot-Rot" in sheep. For the origin of these affections we have hitherto been able to give no adequate reason, but that they exist is patent to any ordinary observer walking over the sheep pastures of this country; for

there he will find animals by the score suffering from painful lameness, due to a disease of the hoof. Any discovery tending to elucidate the causes and cure of Foot-Rot in sheep must result in immense gain, not only in lessening the pain to the animals themselves, but also in the food supply of this country, for it is a well-known fact, that it is not only impossible to get a flock either of lambs or adult sheep to fatten, but, on the contrary, they will lose the condition they have on them, and death is not unfrequent whilst suffering from this disease.

That Professor Axe's observations on Seedy-Toe in horses also apply to Foot-Rot in sheep, I believe there is abundant proof, and I hope that he will not rest satisfied until he has found the "Foot-Rot parasite" also. I am, in common fairness, bound to admit that my efforts to find this parasite have so far resulted in failure, but that it will yet be discovered I have not a shadow of a doubt. That this disease is of parasitic origin there is, to my mind, sufficient evidence. The very history of the disease itself points in this direction. It is contagious, all breeds become affected, no kinds of soil are exempt, and the successful treatment of cutting away all diseased portions of hoof, and applications of powerful escharotics which are germicides—all tend to show that the disease is parasitic. Undoubtedly the heavier breeds suffer more severely than the lighter; Dorset horns are very susceptible to it; in some localities it is found almost impossible to keep this breed in a thriving condition from the fact of their suffering so much from Foot-Rot. The Shropshire and heavy Downs are next in order, and suffer almost as badly, whilst mountain breeds become the least affected; but there is no breed of sheep which can resist the disease entirely if brought in contact with the contagion. That it is contagious we have ample proof; many farmers in our own country can trace its introduction to their flocks from the purchase of a ram or other sheep affected with Foot-Rot, and have found to their dismay and cost, that when once the soil of a farm becomes impregnated with the contagion it is almost impossible to eradicate it again. So well-known is this fact, that in some of our Colonies laws are passed prohibiting the passage of sheep from infected into sound districts. In South Australia, the River

Murray divides the State of Victoria from New South Wales; on the Victoria side of the river the disease is rife, whilst New South Wales is free. The Legislature of the latter State consequently prohibits the introduction of sheep from the former, and so it remains free; although the natural conditions of climate and soil of the two districts are very similar, the river only dividing them.

Professor Law also, from extensive observations on the prairies of America, where he had exceptional facilities for the study of this malady, which a country where sheep have been kept for centuries does not afford, is fully convinced, and is very emphatic, that Foot-Rot is a contagious disease.

It is easy to understand that some soils are more retentive of the germs or parasites than others. I am well acquainted with a piece of land which is so full of the infection that it is with difficulty the owner can induce his shepherd to pasture the sheep on the land, on account of the universal outbreak of Foot-Rot in the flock which invariably follows. Sheep which are kept on old pasture land laid on deep soils formed from alluvial deposits, undoubtedly suffer the most; all kinds of clay offer a good and retentive home for the contagion. Even red sandstone, the true friend of the agriculturist, and which, we are told, possesses higher fertilising properties for every kind of vegetation than any other soil in northern Europe, is not without this scourge.

It is not unknown on Exmoor Forest, a high tract of country, many parts being as much as 17,000 feet above the level of the sea; the soil is here formed almost entirely from decaying vegetable matter. It can and does exist on every kind of soil, whether it is formed from Silurian, calcareous, or more recent formations, and at comparatively great altitudes above the sea. This latter fact fatally opposes our old theory of its origin, which is that we have removed the original home of the sheep (the high plateaux of the world) to low and damp situations, and hence we get a vitiated and unnatural secretion of horn, which we call Foot-Rot. I am willing to admit that this removal of the sheep is a predisposing cause of the disease, by rendering the horn soft, and in a condition suitable to be punctured and destroyed by such a parasite as Professor Axe describes.

XUM

The plantar surface of the foot is almost always the primary spot affected, generally speaking where a small portion of the wall overlaps the sole—in fact, where a few particles of soil containing the parasites could lodge and commence their work of destruction. I do not believe that a low or damp situation only will account for the disease, but it will render the hoof in a suitable condition for burrowing parasites to work on.

THE PATHOLOGY OF BURSATTEE.

BY F. SMITH, VETERINARY SURGEON, 12th ROYAL LANCERS, INDIA.

IN the year 1879, I brought to the notice of the profession certain facts which I had observed in studying Bursattee. I purpose in this short communication to briefly relate the result of my later labours in connection with the pathology of this peculiar disease.

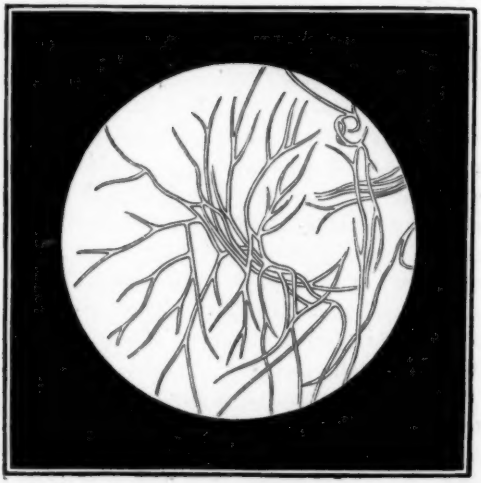

Fig. 2.

The actual exciting cause of Bursattee is a mould-fungus, a drawing of which I attach (Fig. 2). I have found it in every

fresh specimen of the sore that I have examined, but I have not found it after the sore has been hardened by chromic acid. A fine section or scraping of a fresh ulcer should be placed on a slide and examined after the addition of a few drops of liquor potassæ and glycerine. On examination with a quarter-inch objective and a "B" eye-piece, the field is found intersected in every direction with the mycelium. The filaments, or *hyphæ*, are branched, non-septate, $\frac{1}{2000}$ of an inch wide, and so long that they cannot be followed as they pass in and out of the tissue. They converge and diverge, run parallel and transversely to each other, communicate freely by branched processes, and some filaments appear curly. I have seen in a few cases the terminal extremity of a *hypha* end in a rounded, bright, refractive body, very little, if any, larger than the filament itself; the nature of this is doubtful.

It will be observed that the mycelia of this fungus are very small; they appear under a power of 380 diameters as mere threads, and unless reagents be used they might be passed over. I have observed no spores, but I am at present engaged in the cultivation of this mould.

The drawing which I send (Fig. 2) shows the filaments larger than they really are under the quarter-inch objective, but this was necessary for the sake of clearness; it is most difficult in working to follow the threads, as they are so numerous. I should add that in the drawing the structure of the tumour has been entirely omitted, in order to prevent confusion.

These observations may with safety be accepted, as I have verified them over and over again. As the disease is one whose nature has given rise to much controversy, and as I claim to be the first to have seen and described the Bursattee fungus, I may mention that I have demonstrated its existence to the entire satisfaction of Veterinary Surgeon J. H. Steel, who is well acquainted with practical biology, and to Surgeon Major Sibthorpe, Professor of Pathology at the Madras Medical College.

I have lately produced typical Bursattee ulcers by inoculation with portions of tumour, and I am engaged at present working this out, and endeavouring to produce the sore from the cultivated moulds.

THROMBOSIS.

BY A. D. WEBB, A.V.D., 1ST ROYAL DRAGOONS.

THE following interesting case may be considered worthy of record in the VETERINARY JOURNAL. On lately taking over veterinary charge of the 1st Royal Dragoons at Newbridge, a mare was brought to my notice as being the subject of "fits," and as having fallen down on parade on several occasions. Very few days elapsed before I had an opportunity of seeing the said mare in one of these "fits"; she was brought in from parade, having fallen down four times; on return to her stable, she at once threw herself down. I was immediately called in, and found her down, rolling about and sweating profusely. I got her on to her feet and had her led out, and noticed that she moved the hind limbs with very great difficulty, more especially the left one. The entire absence of any perspiration on the hind quarters was very remarkable, the remainder of the body being bathed in it. The coldness of the hind quarters was also very marked; from these symptoms and the history of the case, I at once diagnosed it to be one of Thrombosis of the large arteries of the hind quarters, and decided to reserve my opinion until the following day; in the meanwhile, ordering the mare to be kept in the stable until I had her brought into the riding school for the purpose of being lunged, in order that I might see the symptoms develope themselves. On being led from her stable, she walked and trotted quite freely, nothing abnormal being noticed about the action of the hind limbs. I then started her on the lunge at a steady trot, which I kept up for five minutes; she then began to show great stiffness of both the hind limbs, the left particularly, the same loss of power being noticeable in the muscles of the tail. I then increased the pace to a canter for five minutes longer, which aggravated the symptoms very considerably; she was now pulled up, when she was observed to have an anxious expression of countenance, breathed laboriously, constantly shifting her weight from one hind foot to the other, sweating profusely, anterior of the hind quarters, over which there was no appearance of any perspiration. On placing one hand on the body and the other on the muscles of the quarter, the temperature of the latter

was found to be considerably decreased, this being more marked on the hand being passed down to the hock, which was deathly cold. I then had the bridle taken off, and left her to her own devices at the further end of the riding school; she appeared anxious to move, but was evidently afraid to do so, and only moved the fore extremities from one side to the other, keeping her hind feet a fixed point. All things considered, it required no great amount of deliberation to be quite satisfied that the case was one of Thrombosis of the large arteries of the hind quarters, and probably the femoral arteries to a great extent.

The mare was a well-bred animal in good condition, fourteen years old, and there was no appearance of any wasting of the muscles of the hind extremities; in fact, quite the contrary, the quarters being very muscular. In the stable there was no perceptible difference in the temperature of the hind limbs; the mare fed well, and appeared in good health.

I again had the mare lunged in the riding school for the inspection of the officers commanding the regiment, all the foregoing symptoms again repeating themselves. I recommended that the mare should be destroyed, as she was of no further service.

My recommendation having been sanctioned, the mare was destroyed this afternoon (June 2nd). The *post-mortem* examination was conducted by Mr. Hagger, A.V.D., Dr. Donovan, A.M.D., and myself. On opening the abdominal cavity, I passed my hand to the region of the posterior portion of the aorta, and at once found the correctness of my diagnosis, from the rope-like condition of that vessel; and on further dissection I found that all the blood-vessels of the hind quarters were in a similar condition, as you will see by the specimens I this day have forwarded to you, the arteries of the near hind limb being plugged up as low down as its bifurcation into anterior and posterior tibial, the clot commencing at about the last five inches of the posterior aorta.

This is the fourth case of this kind that has come under my observation, all of them being mares. The one previous to this was an old mare belonging to a friend of mine at Kirkee, Bombay —an animal I knew very well for a long time, she being celebrated

as a very fast trotter in harness; she had never been "sick or sorry" until one day she turned up suddenly lame behind, after being driven about a mile from her stable. About a month passed before I saw her, when I at once pronounced the case to be one of Thrombosis of the large arteries of the hind quarters. The owner handed the mare over to me, as I told him she was of no further use. The only difference in the two cases was that the Indian mare was much more violent on being put to any exertion. She would throw herself about in the most furious manner, utterly regardless of her own safety or that of any one near her, squealing and in every way giving evidence of the most intense agony I ever saw, for about half-an-hour, when all symptoms of suffering would entirely disappear. I kept her for about six weeks. She was then destroyed, the *post-mortem* examination being attended with similar results. The specimen I gave to Inspecting Veterinary Surgeon Charles Steel, for the Poona Veterinary School.

PARTURIENT ECLAMPSIA IN THE COW.

BY G. G. MAYOR, M.R.C.V.S., KIRKHAM.

HAVING recently had a case which presented in a well-marked manner the symptoms of this unusual disease, I have ventured to lay a brief account of it before the readers of the VETERINARY JOURNAL.

History, etc.—March 18th, my immediate attention was requested to a cow, lately calved, which, the owner feared, was "going down in Milk Fever." On my arrival at the farm I found my patient to be a valuable shorthorn, six years old, which had given birth to its fourth calf on the 9th, being a week past "her time." Parturition had taken place easily, the fœtal membranes came away very shortly, lochial discharge was established, and all appeared to be going on well until the 17th, when the owner observed that the discharge from the womb was checked, and the appetite and lacteal secretion were slightly impaired. Next day at noon, in addition to the foregoing indications, the animal was noticed to be "tottering behind," whereupon my attendance was requested. Shortly

before my arrival the cow went down. I should add that the animal had been bred on the farm, was of healthy stock, and in good condition.

Symptoms.—Animal laid in a fairly natural position; pulse 100 and irritable; respiration, dyspnotic and partially oral; eyes generally fixed in a wild, unmeaning stare, but occasional strabismus was present, and at times, when there were violent clonic spasms (particularly of the hind extremities), the eyes pirouetted rapidly. The surface of the body was rather cold, fæces scanty. Suddenly the animal sprang to its feet, and appeared as if immediately about to fall; then it threw itself violently backwards, somewhat in the position of a horse suffering from Acute Laminitis in the fore feet, and there was intense spasm of the extensor muscles, and violent trembling of the whole body. The vulva was unnaturally contracted, and dry in appearance, and the hand, on introduction to the genital canal, found the mucous membrane almost parched.

Gradually the acute symptoms subsided, though for some time the cow appeared as if about to fall. In the course of several hours she laid down, ruminated, and appeared anxious for food.

There were several more slight attacks, but none of anything like the severity of the first.

For some days the cow seemed weak, and the pulse was very variable in character, but there were no convulsions after the first twenty-four hours—at least, none were seen. Before the week end all appeared right, and has continued so. Lochial discharge re-commenced about the third day.

Treatment.—A brisk cathartic, with a large dose of chloral hydrate, was administered immediately, and injections, both rectal and uterine, the latter being carbolised. Mild, stimulating liniment was applied along the course of the spine, a wet bandage put on the head, and the animal warmly clothed. Subsequent treatment consisted in repeated small doses of Hyd. chlor., and Spt. æth. nit., with occasional injections as before. Diet for the first eighteen hours was confined to gruels, etc., afterwards light, easily-digestible food was allowed in small quantities oft repeated.

Remarks.—I should suppose that the exciting cause of this attack must have been a chill (from a door accidentally left

open) producing arrestation of the lochial discharge—at least, I could not discover any other circumstance about the case likely to have induced it, and the rapid recovery in the general health which took place after a few days, when the discharge was re-established, tends to confirm me in this view of the case.

THE INFLUENCE OF HEREDITY AND CONTAGION ON THE PROPAGATION OF TUBERCULOSIS.

(*Continued from page* 173, *vol. xviii.*)

Rabbits, guinea-pigs, calves, pigs, goats, horses, dogs, cats, monkeys, and pigeons were experimented upon, and for the insertion of the supposed nosogenic principle various parts of the body were selected. Numerous inoculative procedures were invoked, and the matter selected for inoculation was used in different forms and after it had been submitted to varied preparation. It was inserted into the subcutaneous connective tissue, bronchi, the thoracic and abdominal cavities, as well as the blood-vessels; it was introduced into the trachea after it had been reduced to powder, and it was passed directly into the stomach by means of the œsophageal sound.

Notwithstanding this great divergency in the essential condition of the experiments, the general result was such, that *the transmissibility of Tuberculosis, by various channels, could no longer be a matter for doubt.*

The experiments which furnished negative results with regard to the contagiousness of this malady, could in no way affect the results of the experiments which yielded affirmative evidence, as in such investigations we cannot limit ourselves to enumerating facts, but must analyse and appreciate them. Is it not sufficient, when an experiment is made under irreproachable conditions, to establish a constant fact from a single positive result? Can negative results, counted by thousands, reverse an established fact? Evidently not.

In order to include at a glance the total of the experiments made, we shall present them as nearly as possible in the order in which we have given a *résumé* of the clinical facts.

Günther and Harms placed five rabbits in a cage, which they

suspended in front of the head of a tuberculous cow, in such a way that the rabbits were compelled to inspire the air expired by that animal. The autopsy of the rabbits did not reveal any alteration in their organs. The result was different when the animals were brought into contact with the expectorations from phthisical people. Tappeiner, in the experiments he made, and the results of which caused much sensation, found that the inhalation of matters expectorated by consumptive persons, even when in very small quantity, never failed to produce Pulmonary Tuberculosis in the dog, and, in certain circumstances, generalized Tuberculosis. The duration of the incubative period varied, in these cases, between nineteen and twenty-three days. According to this able experimentalist, the inhalation of scrofulous matter, or that derived from purulent expectorations from inflamed bronchi, will not produce Tuberculosis.

When these experiments were made, it was also sought to determine the action which the ingestion of such substances as the flesh and milk from tuberculous animals might produce on those who consumed them, and with this view experiments were undertaken nearly everywhere.

Johne,* in a very complete and learned work on the history of bovine Tuberculosis, gives the following *résumé* of the results of experiments made with the object of establishing this action :—

Animals Experimented upon—	Results. Affirmative. Per cent.	Negative. Per cent.	Doubtful. Per cent.
1 Horse	0·0	100·0	0·0
5 Calves	100·0	0·0	0·0
35 Sheep	51·4	42·9	5·7
13 Goats	84·6	15·4	0·0
60 Pigs	65·0	18·3	16·6
17 Rabbits	31·2	66·5	2·3
20 Dogs	25·0	75·0	0·0
9 Cats	55·5	44·4	0·0
6 Guinea-pigs	83·3	16·6	0·0
2 Pigeons	0·0	100·0	0·0
322	43·5	51·1	5·0

Of the 322 alimentation experiments, 259 were made with uncooked food ; and of these the affirmative results were 47·7 per

* "Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie," 1883, p. 32.

cent., the negative results 48·9 per cent., and the doubtful results 3·3 per cent. In 62 experiments aliment was employed which had been cooked for ten or fifteen minutes, and the following were the results: 35·5 per cent. affirmative, 64·5 per cent. negative, and 1 per cent. doubtful.

Classification of these experiments according to the alimentary substances employed, gives the following result:—

	RESULTS.		
	Affirmative. Per cent.	Negative. Per cent.	Doubtful. Per cent.
117 Animals fed with tuberculous matter from a heifer	61·5	34·2	4·3
46 fed with the raw flesh of tuberculous cows	13·1	86·9	0·0
91 fed with milk from tuberculous cows	30·7	59·3	1·0
1 fed with milk from tuberculous rabbits	100·0	0·0	0·0
25 fed with tuberculous matter from human beings	36·0	64·0	0·0
33 fed with tuberculous matter from a pig	53·0	47·0	0·0
2 fed with tuberculous matter from a sheep	100·0	0·0	0·0
2 fed with tuberculous matter from a rabbit	50·0	50·0	0·0
3 fed with tuberculous matter from monkeys	100·0	0·0	0·0
5 fed with tuberculous matter from birds	100·0	0·0	0·0

In reviewing these experiments and well-established clinical facts, Johne arrives at the following conclusions:—

1. The transmission of Tuberculosis may be effected from animal to animal and from man to animals, by the ingestion of tuberculous matters, but this mode of transmission is much more uncertain than that by inoculation;

2. The matters which most certainly transmit Tuberculosis by gastro-intestinal ingestion, are those obtained from the lungs, the pleura, and lymphatic glands; the milk of tuberculous animals, with regard to its more or less certain action as contagious matter, coming next to these. Infection takes place less readily with tuberculous matter obtained from mankind than with that from animals;

3. Infection takes place less readily by the ingestion of flesh

than by means of the substances mentioned in 2, and yet it was employed successfully in seventy-six of the cases shown in the above table;

4. Calves, sheep, goats, and pigs present, as has been already mentioned, and as has been so well shown by Bollinger, the greatest receptivity for the tubercular contagium. With regard to the supposed immunity of the carnivora, it is not so definite as some authorities believe.

Among the experiments which specially merit our attention, we mention those made by Gerlach. Of 46 different animals submitted to experiment, and fed with *uncooked tuberculous substances*, 35 were infected; of 35 animals fed with *uncooked flesh* from tuberculous cows, 8 contracted Tuberculosis; and of 15 fed on *cooked* tuberculous matter, 10 became diseased.

Beside the experiments of Gerlach, we may cite those made by Bollinger.* The learned experimentalist employed the milk of tuberculous cows, which he gave to pigs, and the conclusions to which his experiments led him, in presence of the pathological preparations derived from them, was that *the prolonged consumption of the milk of tuberculous cows produced miliary Tuberculosis in the pig.*

The experimental inoculation of tuberculous matter into the *subcutaneous connective tissue, into the thoracic and abdominal cavities, and into the anterior chamber of the eye*, has given a relatively greater number of facts in support of the transmissibility of the disease than the ingestion of this matter. Subcutaneous inoculations have, especially with rabbits, generally produced results analogous to those arising from the insertion of non-tuberculous matters. The authentication of this fact has been the cause of long and violent discussions, which did not terminate until Cohnheim, Salomonsen, Hänsell, Deutschmann, and Baumgarten had recourse to intra-ocular inoculations on white rabbits with pink-coloured iris. On this organ the tubercular evolution can be closely watched, and it is observed that, after an incubation of twenty to thirty days, there appear nodules on it, this change being followed by general miliary Tuberculosis.

* "Versamlung deutscher Naturforscher und Aerzte," 1879, in Baden.

Baumgarten* injected into the anterior chamber of the eyes of a certain number of rabbits, some drops of blood from a recently-killed animal which presented very marked lesions of Tuberculosis, developed after inoculation. By means of these injections he produced a typical ocular Tuberculosis, which rapidly led to general infection. Tubercles appeared after three or four weeks in the inferior segment of the iris, close to the point where the blood had lodged. The number of these tubercles gradually became more and more numerous in the eye, and finally there supervened the manifestations and lesions of generalised Tuberculosis, which killed the creature. This experimentalist repeated these experiments with the blood of healthy animals, but there was no consecutive morbid result. The result was also negative in several cases in which he substituted for the blood of healthy animals, that of creatures affected with Septikæmia or some other malady; in other cases the injection of such blood caused Ophthalmia of variable intensity, but never Tuberculosis.

Among recent experiments, we ought specially to mention those of Toussaint, Professor at the Toulouse Veterinary School. This observer has, by numerous experiments continued during several years, sought to demonstrate the contagiousness of Tuberculosis. For these investigations, which required thousands of animals, he employed pigs, rabbits, and cats, as the disease is more surely and rapidly developed in them. The fluid expressed from the lungs of a tuberculous cow was that which he employed. He injected 1·5 cubic centimetres into a pig, and to two rabbits ten drops of this fluid, which was nearly quite transparent. He heated the fluid to a temperature of 55° to 58° Cent. for ten minutes in a water bath, and inoculated four pigs and four rabbits with it. All these animals became tuberculous, and the four which had been inoculated with the heated material perished even more rapidly than the others. Of the four rabbits, one succumbed thirty-five days after inoculation, and the others between the 164th and 170th day after the operation.

Two rabbits were inoculated with tubercles from the lungs of a

* "Centralblatt für die Med. Wissenschaft." No. 15, p. 274.

pig which had been inoculated with the heated fluid, and killed three months afterwards. The rabbits were killed in about two months, and found tuberculous.

In another series of experiments, morsels of the flesh of a tuberculous pig were roasted in the flame of a gas-burner, and two rabbits were inoculated with the juice expressed from these. Two other rabbits were inoculated with juice from pieces of non-roasted flesh. The latter died 120 days after inoculation ; one of the former was killed on the fifty-sixth day, and was found to be tuberculous ; the other was alive when the report was published, but it was very emaciated.

In a third series of experiments, Toussaint employed nasal mucus, saliva, and the urine of tuberculous animals, for his inoculation experiments. Three rabbits were inoculated at the base of the ear with the transparent mucus that flowed from the nose of a phthisical cow. In about two weeks there appeared a tuberculous nodule at the seat of inoculation, and the *parotidean lymphatic glands* were tumefied. Seventy days after inoculation the rabbits were killed, and in their lungs were found tubercles, the majority of which were grey, and some were already undergoing caseation.

The inoculation of saliva from a tuberculous cow yielded the same result, only the lung tubercles were less developed. In injecting some drops of urine from a tuberculous pig, beneath the skin of a rabbit's ear, rapid emaciation ensued, and four months after inoculation the rabbit died. The lesions of caseous Pneumonia were noted at the autopsy.

Reviewing the facts acquired with regard to Tuberculosis, Toussaint is of opinion that if cows lodged together in a building frequently become tuberculous, the cause should be sought, not in the food, but in the action of a morbific principle.

Chauveau had already observed that heifers which feed out of the same trough become tuberculous whenever a phthisical animal is found among them.

If among animals which live in the same stable, and eat and drink out of a common trough, there are those affected with the disease, the possibility of transmission of the contagium to all of them ought to be admitted.

There is another fact which merits attention. Toussaint vaccinated tuberculous cows by making seven punctures around the vulva, and implanting therein the contents of a vaccinal pustule, developed on a perfectly healthy heifer. Eight days after inoculation the vesicles appeared, and with the serosity from them four rabbits and a pig were inoculated. Two of the rabbits were killed in two months. Both were tuberculous. The other two rabbits were alive at the date of report, but in such a state of emaciation as to leave no doubt as to the existence of the malady.*

From the clinical observations already cited, as well as the numerous experiments which have been made, tending, as they do, to establish the infectious character of the malady under consideration, it evidently results that *Tubercular Phthisis is a contagious malady, equal, in infectiveness, to Glanders and Contagious Pleuro-pneumonia.*

It is not only contagious in the ordinary acceptation of the word, but it is also transmissible by the milk and flesh of affected animals, if these matters are introduced into the digestive canal. *Contagion plays, in the propagation of this disease, a more active part than heredity, which very often does not sufficiently explain its frequency.*

Another question which may be raised here, is as to whether animal Tuberculosis is the same as human Tuberculosis, and if so, in what way they are related.

In attentively following the history of Tuberculosis in man, as we find it in the works of Waldenburg,† we are forced to recognise that physicians have been no more fortunate than veterinary surgeons in their attempts to clearly define the malady.

Until the eighteenth century, medical men had included under the designation of *Phthisis*, all the acute and chronic diseases of the trachea, bronchi, lungs, pleuræ, and lymphatic glands, whenever debility and emaciation accompanied these affections.

The existence of tubercles was more or less unknown to them. It was during that century—the epoch of the *renaissance* of

* "Compte Rendu de l'Académie," Tome 93, Nos. 5, 6, 7, 10, 15.
† "Die Tuberculose, Lungenschwindsucht und Scrofulose." Berlin, 1869.

anatomy—that physicians began to appreciate at their just value the pulmonary nodosities of Phthisis, which the majority of them had hitherto looked upon as *glandulæ*; but it was not until the second moiety of the century that Stark, in his description of the miliary tubercles of Phthisis, distinguished them from glands or *glandulæ*, and attributed them to a formation *sui generis*.

The English physician, Reid, from his researches arrived at the same conclusion.

At a later period—in the ten last years of the past century—Matthew Baillie not only ascertained that the groups of nodules or large nodosities were due to the confluence of miliary tubercles, but he also noted, in the most precise manner, the existence of tubercles in other organs than the lungs, and especially in the liver, spleen, kidneys, peritoneum, and cerebral envelopes. He also declared that the substance constituting the majority of the tubercles was a white, soft, cheesy material, which he qualified as scrofulous matter.

The works of Bayle and Laënnec, two French physicians, may be said to have served as a basis for the views now prevailing as to the nature of Tuberculosis. Bayle was the first to describe, under the designation of "miliary tubercles," the small nodules which, by their confluence, give rise to the formation of pulmonary *noyaux*, and he was the first who insisted on their progressive development. He says:—"Tubercles may be present in three different forms; they are at first firm, then they soften in their centre, which is transformed into a purulent, grumulous matter; finally, they are entirely destroyed by suppuration."

This physician also mentions the existence of nodules in the larynx, bronchi, tonsils, and mesenteric glands, and describes the ulceration of the mucous membranes produced by the softening of the tubercles. He declares that the nodules do not indicate a local affection, but that they are due to a special diathesis—the tubercular.

(To be continued.)

Editorial.

ACTINOMYCOSIS.

Since attention has been drawn to the existence of this mycological disease, through the medium of German and Italian medical and veterinary periodicals and, in English-speaking countries, by means of the Veterinary Journal, rapid progress has been made in its investigation, and particularly with regard to its geographical distribution. Since the announcement of its discovery in this country was made in the pages of this Journal, it has been found to prevail extensively in the United States and in our North American possessions; Jensen has recently described the appearance of the disease in an enzootic form among cattle at Nykjæbing, on the north side of the island of Seeland; and Nocard has still more recently reported the existence of the malady in France, a specimen having been sent to the Alfort Veterinary School from the Paris abattoir; and there is reason to believe that the geographical range of the affection will ultimately be found to be very wide. Though the bovine species is more especially liable to it, other species are not exempt, as our pages have frequently testified, and, as the present issue shows, swine are not exempt, if the observations of Duncker are well-founded. In this country, though first discovered in Gloucestershire, yet it appears to be more common in Scotland than elsewhere, and though no cases have been reported in Ireland, yet it can scarcely be absent from that island.

Much has yet to be learned with regard to the manner in which infection takes place, but now that the malady is being closely and carefully studied we shall, doubtless, soon be in possession of important information with regard to it.

One of the most recent writers on the subject—M. Firket, of Liege, Belgium—in the *Revue de Médecine*, confirms the fact that the anatomical lesions are due to the colonisation and development in the tissues of the *Actinomyces bovis*; that the disease spreads from one part of the animal to another by transference of the fungus, and that it can be similarly transferred to other animals, but that such propagation is limited to particular species of animals. As to the manner in which the parasite exerts its pathogenic action, much yet remains to be made out. It does not appear to produce "coagulation necrosis"; but, from a study of the earliest-formed colonies, Firket finds that the first effect of the vegetation is to induce cellular hyperplasia. It is as if the tissue-elements resented the intrusion of the parasite, which, however, mostly gains the upper hand, so that the issue is the formation of inflammatory and suppurating foci that characterise the disease. The frequent occurrence of the primary tumours in relation to the jaws and tongue, seems to indicate that the fungus gains entrance with food. Firket, whilst admitting that this is possible sometimes, points out that it will by no means account for all cases, since it implies a breach of surface in the buccal mucous membrane, which often does not exist. It is more probable that abrasions of the skin afford a way of contamination;

whilst cases have been recorded by Ponfick and others of Pulmonary Disease obviously dependent on the inhalation of the fungus. Pflug, as already noticed in this Journal, reports a case in which the lungs were invaded by a multitude of tumours containing the *Actinomyces*. And in the cases of Mammary Actinomycosis observed in the sow, it is more than probable that the parasite has been introduced into the milk canals and sinuses, possibly by the prickly parts of plants coming into contact with these glands.

Speaking of prognosis, M. Firket remarks that the disease, especially in the cervical form, is capable of being cured by energetic treatment, whilst if left alone the issue is invariably fatal. Surgical intervention, in the opening of abscesses, and scraping their walls and the walls of the fistula, is the only mode of dealing with a malady which he compares, not inaptly, to the Madura Foot Disease in man, due to the presence of the fungus *Chionphye Carterii*.

Rosenbach, in abscesses caused by the *Actinomyces* in man, has on several occasions obtained good results by the interstitial injection of a solution of carbolic acid—one part to ten of water.

When the bones are involved, as happens so frequently in the ox tribe, re-section of these must be resorted to, and in the case of these, as of the soft tissues, caustics and astringents must be freely employed.

In several respects Actinomycosis is a most interesting malady, and well deserves the attention of those members of the veterinary profession who have opportunities for studying it. Though many points in connection with it have been fairly well established, there are others which need elucidation, and it is to these attention should be more particularly directed.

MEMORANDUM ON THE "CAT-PLAGUE" IN AHMEDNAGAR, 1881, AND IN SIRUR, INDIA, IN 1883.

I.—*Ahmednagar*, 1881.

In 1881, Cholera prevailed at Ahmednagar from about the beginning of July till the middle of August. During the first part of this period a great and unprecedented mortality occurred among the cats of the city. About 750 cats were reported to have died between the 1st and the 25th of July, 1881. The precise date when the epidemic ceased is not stated. The symptoms of the disease, as somewhat meagrely described in the reports received, were as follows :—

"A day or two before the cat died it appeared inactive, took no food, and tried to find some cool place where it could rest. The throat of the animal became swollen and choked, and when it died it foamed at the mouth."

The dead animals were removed by the local Municipality to a distance from the city, and buried deep in the ground, in the vicinity of the Municipal night-soil depot.

2. The Civil Surgeon of Ahmednagar, Surgeon-Major R. H. Batty, was requested by the Municipality to examine the carcase of a cat which had died of the disease, with a view to ascertain the cause of its death ; but that officer suggested that a veterinary surgeon should be consulted in the matter, which fell within the province of veterinary science. Accordingly a letter

was written to Mr. W. Lamb, the inspecting veterinary surgeon, then at Poona, requesting him to state his opinion as to the nature and cause of the mortality among cats, and proposing to forward for his examination the carcase of a cat which had died of the disease. The symptoms of the disease as described to Mr. Lamb were those stated above, and on a consideration of them he was of opinion that the cats were probably suffering from the destructive malignant disease called Anthrax, which frequently attacks cattle, and for which there was no remedy. As regards the transmission of the carcase of a cat to him, he was of opinion that the *post-mortem* changes in the carcase would be too rapid to admit of his being able to arrive at a fair conclusion from an examination of it, after the lapse of time which must necessarily take place between the death of the animal and his examination of its carcase in Poona. He therefore suggested that the civil surgeon of Ahmednagar should be requested to communicate to him the result of his examination of the carcase of a cat recently dead, stating particularly whether the different organs of the body had an abnormal appearance, and more especially whether the spleen was much enlarged and dark in colour, the stomach empty and inflamed, and the blood-vessels distended with black, treacly blood. He also requested that a tablespoonful of blood taken from a dying or very recently dead animal should be sent to him enclosed in an airtight bottle so that he might examine it microscopically with a view to the discovery of organisms such as exist in the blood of animals affected with the Anthrax. If the disease was Anthrax, as he suspected it to be, the causes which originated it were, in Mr. Lamb's opinion, such as would undoubtedly affect human and animal health generally, and would on that ground render sanitary precautions necessary.

3. On receipt of Mr. Lamb's letter, the civil surgeon was requested to hold the necessary *post-mortem* examination, and to forward a spoonful of the blood of a cat affected with the disease to Mr. Lamb. This, however, does not appear to have been done. The late Mr. Veterinary Surgeon Knott is stated during his visit to Ahmednagar in August, 1881, to have examined the bodies of some of the animals which had died of the disease, but the results of the examination do not appear to have been reduced to writing.

II.—*Sirúr*, 1883.

4. On the 21st of June, 1883, the collector of Poona reported that the Mámlatdár of Sirúr had informed him, that from the 1st idem up to date 125 cats had died at Ghodnadi (Sirúr), and that the chief symptom noticed was vomiting. In forwarding the collector's letter to Government, the commissioner, C. D., Mr. Robertson, observed that Cholera was prevalent at Sirúr at the time, that similarly when in 1881 Cholera was prevalent at Ahmednagar there was a great mortality among cats in the city, and that if the deaths were due to cholera, precautions were obviously necessary in the disposal of the dead animals.

5. Upon this, Government directed that a *post-mortem* examination of the body of a cat that had died of the disease should be made. Surgeon A. K. Stewart, the medical officer attached to the Poona Horse, was accordingly requested by the collector of Poona to hold the necessary examination, but by the time the collector's letter reached Surgeon Stewart the epidemic among cats had ceased, and he was therefore unable to make a *post-mortem* examination. He, however, instituted inquiries on the subject of the epidemic among cats, and submitted a very interesting report, the substance of which is given below.

6. According to Surgeon Stewart, the disease among cats had, as far as he could ascertain, never before appeared at Sirúr. On the 19th May, 1883,

Cholera broke out at Sirúr, and about the 1st of June, cats died at the rate of twelve a day. Cholera ceased on the 22nd June, and the worst part of the cat epidemic was over by the 18th of the same month, although the disease continued to prevail among the animals to a slight extent for two or three weeks afterwards. Altogether, according to popular report, 300 cats died during the epidemic, *i.e.*, fifty per cent. of the total number of cats in the town. Surgeon Stewart examined nine individuals whose cats had died of the disease. Eight of them gave evidence of symptoms so resembling each other that he classes those symptoms as constituting one form of the disease. The case of the cat belonging to the ninth man he treats separately. This cat suffered from by far the most severe type of the disease, and the evidence of the man who owned it is particularly valuable, as he was the most intelligent of all the persons examined. The symptoms of the two types of the disease are thus stated :—

First Type (*eight cases*).

(i.)—The cat is first noticed to be ill. It rapidly becomes extremely restless, not sitting for any length of time in any one place, but shifting about. As it walks it staggers in its gait like a drunken man. Some of the cats cried very loudly and incessantly, which made the owners aver that they were in great pain. All food and drink are refused from the commencement of the illness till death, which seems to be the usual termination, although Surgeon Stewart heard of a cat, not included among the eight treated of in this paragraph, which had recovered after three days' illness. There are no cramps in the limbs, as evidenced by an absence of lameness. Vomiting sets in as a rule, although it did not do so in two out of the eight cases, the number of times the animals vomited varying from two to twenty times, or more. Great salivation and foaming at the mouth are invariably present. The matter vomited is usually yellow, but sometimes green, and in one case it was white. Throughout the illness there is no diarrhœa. All the people who handled their cats said that there was great heat and fever. As the disease progresses, and as far as Surgeon Stewart could discover, at a very early stage the features of the animals become pinched and shrunken, and the eyes sink in the head ; and this is such a marked feature of the disease that the owners of all the eight animals noticed it. Only one man noticed the state of the conjunctiva, and he said that he saw a yellow tinge. Gradually the cats either assume a comatose or lethargic condition, or else attacks of convulsions set in ; and after a time, varying from ten to thirty-six hours, death occurs, the cat either dying quietly or during an attack of convulsions. No cases of cholera had occurred in the houses of the owners of the eight cats, but in several instances such cases had occurred in the neighbourhood, within a few yards of the house. The owners of two out of the eight cats said that the animals changed colour, one of them, which was white, becoming somewhat darker, and some of the hair of the other, which was of a brindled sandy colour, becoming white. Five of the dead cats were put into dust-bins, one was buried by the owner, and two were left where they died.

Second Type (*one case*).

(ii.)—The cat, which was a very strong, black animal, was well when it was let out of the house at six o'clock in the morning, and by twelve o'clock that day, or within six hours, it was dead. It showed signs of illness shortly after re-entering the house, and vomited at least twenty times, the vomit being black like coffee-grounds. A thick slime ran from the animal's mouth, and it had two white, watery stools like congee-water. The eyes were

so sunken that it was only with difficulty they could be seen when open. The colour of the conjunctiva was not noticed. The animal was extremely restless during illness, moving about from place to place. It refused all food and drink, cried a little during the first hour of its illness but not afterwards, was not lame from cramps when it walked, but staggered in its gait and seemed quite stupid. It had no convulsions, and died quite quietly. The owner said that the cat was decidedly colder than was natural during illness, and that after death it became very rapidly cold. The colour changed from black to rusty brown, and so great was the change that the owner had to look at the animal twice before he could believe that it was his own cat.

7. On the whole, Surgeon Stewart is of opinion that the disease from which the animals suffered was a malignant epidemic disease of the most virulent type, resembling Cholera in some points, but in others much more resembling what one would expect to find in cases of Yellow Fever, a disease of which he has no personal experience, but in which acute atrophy of the liver forms one of the leading features. The precise nature of the disease can, however, be determined only by holding *post-mortem* examinations and by experimenting upon animals; and as the same disease assumes such different aspects in men and animals, Surgeon Stewart considers it to be of the greatest importance that the investigation should be entrusted to an expert who has a thorough knowledge of epidemic diseases affecting animals. Such an expert may possibly be able to decide whether the disease is that known as "charbonous fever without eruption," the only disease known to veterinary science which Surgeon Stewart can discover as closely resembling the one described above. This affection differs widely from Cholera in many of its symptoms, but the question of its identity can easily be set at rest by experimenting on cats in towns where Cholera is still lingering. A number of cats might be made to swallow the excretions from patients affected with Cholera. Some of them might in this way become infected with choleraic poison, and should they exhibit the train of symptoms described above in paragraph 6, a proof will have been obtained that the disease is Cholera, modified by its presence in the cat. And if it is established that the disease is communicable from human beings to cats, it would be highly probable that it would be communicable from cats to human beings.

8. In connection with the epidemic among cats, Surgeon Stewart mentions that a very similar disease attacked some of the cattle at Sirúr, principally young, healthy buffaloes. He examined three individuals who owned nineteen buffaloes and five cows between them. Of these, ten buffaloes and one cow were attacked with the disease, and died. All were young, healthy animals, only one being of medium age; and all were in calf, except one buffalo and the cow. Death occurred within from fourteen to eighteen hours. The symptoms were panting, salivation, running from the nose and mouth, restlessness in some cases, and rapid death. Diarrhœa, eruptions, or jaundice tinge of the eyes were not present. Six of the animals were attacked between the 18th and 21st of July, one was attacked on the 23rd idem, one on the 28th idem, one on the 29th idem, one on the 2nd August, and one on the 7th idem.

XUM

KOCH ON TUBERCULOSIS.*

THE first volume of the "Mittheilungen"—a work comparable to the scientific reports which are issued in connection with the department of our medical officer of the Local Government Board—issued three years ago, was largely occupied with the admirable researches of Dr. Koch and his colleagues upon Anthrax and Septicæmia. The volume just issued,† of nearly 500 pages, exhibits a more varied character, but the chief place is given to the subject of Tuberculosis. Diphtheria, Typhoid Fever, and other affections in which micro-organisms play a part, are also dealt with in various papers, but the main interest, we believe, will centre in this question of tubercular disease. It is treated of in the opening paper, on the Etiology of Tuberculosis, by Dr. Robert Koch, a work completed by that scientist on the eve of his departure for Egypt; and it appears also in papers on the Mortality in Phthisis, by Dr. Würzburg; on the Occurrence of Bacilli in the Sputum, by Dr. Gaffky; and on the Disinfection of Phthisical Sputa, by Drs. Schill and Fischer. In the present notice we propose to confine our survey to Dr. Koch's article.

In his opening remarks Koch points out that the doctrine of Tuberculosis being a communicable disease is based on clinical observation, on anatomical facts, and on experimental research. The results of the first of these are inconclusive and uncertain. As to the anatomical facts, Buhl's doctrine of infection from caseous foci has been supported by the discoveries of Tuberculosis in the thoracic duct by Ponfick, and in veins by Weigert, and many other facts, which need not be further alluded to, upon the supervention of Acute Miliary Tuberculosis. On the experimental side the infectivity of tubercle was shown by Klencke in 1843 (but his work has been forgotten), and later by Villemin, whose researches stimulated so many and such contradictory experiments by others, but chiefly by Cohnheim and Salmonsen, in the results of their inoculations of the eye. The doctrine thus established, it became necessary to inquire into the nature of the virus; and the discovery of a micro-organism (the Bacillus Tuberculosis), with the study of its properties, have resulted in the accumulation of so much evidence that all that the most extreme sceptic can now assert is that the bacillus is a concomitant, and not the cause of the disease. Therefore, to prove that it has a causal connection, it had to be shown, as in the case of Anthrax, that the organism, after isolation and cultivation, could reproduce the disease when inoculated in the body.

After this introduction he proceeds to relate, with that remarkable clearness and accuracy that stamp all his work, the methods employed for the detection of the bacillus in tubercular tissues and their products, its relatively small size necessitating the employment of special processes of staining, which he describes. He points out that of all bacteria, none of those which most approach the tubercular bacillus in size take on the staining (methyl-blue), except the bacillus lepræ; but he justly adds that it would be a great error to assert that the etiological importance of the bacillus rests solely upon such colour-tests. It is not unlikely that other reagents will be found to stain these bacilli, and he notes that Ehrlich's process has already been much modified, especially by Ziehl, with more or less success in this direction. The colour fades rapidly, but it is not difficult to re-stain the preparations.

* From *The Lancet*.

† (Mittheilungen aus dem Kaiserlichen Gesundheitsamte. Herausgegeben von Dr. Struck, Geheimen Ober-Regierungsralte, Directer des Kaiserlichen Gesundheitsamte. Zweiter Band.) Berlin: Hirschwald. 1884.

He then describes the distribution of the bacilli in the tuberculous nodules; a distribution which varies much in amount and extent, even in the same case. In miliary nodules bacilli are to be found lying between and in the cells, which soon break up, the bacilli also being destroyed or yielding spores which resist the staining agent. Most remarkable is their relation to the "giant cell," which is almost invariably the seat of one or more bacilli, even if these latter be absent from other parts of the tubercle. The probability is that the bacilli gain entrance into "Wander-cells," which become stationary and take on epithelioid and "giant" forms under the action of the parasite. The giant-cell generally endures longer than the bacillus; but if the invasion of the bacillus is great, the cell may break up and rapidly degenerate. The further changes of the tuberculous nodule are wholly regressive—it caseates, and the bacilli soon disappear in the cheesy product, or it shrinks and becomes fibrous. The formation of spores is also described.

The next section deals with human Tuberculosis, and first with Acute Miliary Tuberculosis, of which nineteen cases were thoroughly examined, bacilli being found in all the tubercular nodules, most richly in those of more recent formation. There they are described in the lungs, liver, and spleen, in pia mater (very abundantly between masses of epithelioid cells around the small arteries), in the ocular choroid and elsewhere, and brief details are given of most of the cases. Next Pulmonary Phthisis, of which twenty-nine cases thoroughly examined yielded the bacillus in all—most abundantly in recent caseous infiltrations and within the walls of rapidly-forming cavities, most sparsely in the fibroid variety. Their number varies in different parts of the same lung. No doubt they are disseminated by the cell infiltration, and they would seem to directly cause the disintegrating process, the advance of which supplies them with fresh soil for their continued vegetation. They may be distributed through the lymphatics or blood-vessels, or by means of the sputum over the larynx and intestine, setting up tubercular changes therein; and the inhalation of the contents of cavities into other parts of the lung is, no doubt, a fertile cause of the local extension of the disease. The occurrence of bacilli in the sputum is quite diagnostic, and they may be readily distinguished from other bacteria which occur in the saliva, or in connection with putrefactive changes in the vomicæ. They also occur in the stools in Intestinal Tuberculosis, and in one case Gaffky found another but larger bacillus giving Ehrlich's reaction in these excreta.

In a third section the occurrence of the bacillus is described in Tuberculosis of various organs; in two cases of Tubercular Ulcer of the tongue, in four of Renal Tuberculosis, in one of the bladder, and one of the uterus. In five cases of Tubercular Testis, bacilli were sparsely found, and in two cases of solitary tubercle of the brain. Then comes a section devoted to their occurrence in scrofulous glands. Twenty-one cases were examined, the bacillus occurring in the giant cells, but rarely in the caseous mass. In thirteen cases of tuberculous disease of joints, three of hip, five of knee, three of elbow, one of foot, and one of finger, the fungous granulations contained bacilli; and in ten cases of bone disease (three carpus, five tarsus, two Vertebral Caries) bacilli occurred in all but one, where the pus from Spinal Caries was examined with negative result; but inoculation experiments confirmed the tubercular character of this case. Seven cases of Lupus were examined, and in all, although with marked scantiness, bacilli were found in the giant cells of this formation. Inoculation experiments with Lupus tissue produced Tuberculosis in the rabbit.

Having thus surveyed the tubercular affections of man, Koch passes to those of animals, and he remarks that, although no warm-blooded animal is proof against the virus, yet the form of the lesions differs in different species. Thus, in the guinea-pig, the liver and spleen are the seats of extensive ne-

XUM

crotic change without caseation ; in the monkey, there is rapid softening, with suppuration, of the tubercular masses ; in man, caseation is the main outcome ; in the "Perlsucht" of cattle, calcification and caseation ; and in the fowl, large tumours infiltrated with lime salts. In spite of these morphological differences, the disease is in essence the same; and the bacillus is to be met with in all its forms. He specially describes the seat and distribution of bacilli in tubercular disease of cattle ("Perlsucht"), of the horse, pig, goat, and sheep, of the fowl and monkey. He notes the rarity of spontaneous Tuberculosis in the guinea-pig and rabbit, unless under conditions suitable for contagion. For, previous to experimentation on this subject, he had hardly met with the disease in the many hundreds of such animals examined, until some part of the laboratory was devoted to the creatures which were inoculated ; then Tuberculosis appeared amongst others which were not inoculated. The "spontaneous" disease differs from the "artificial," in these animals, in being limited to a few foci in the lung, instead of having a wider dissemination. A section is then devoted to the artificial production of Tuberculosis in animals, and the variety of appearances produced. This portion of the work, which is most richly illustrated by many beautiful chromo-lithographs, closes with a summary, which may be thus briefly paraphrased. In all morbid products which, from their mode of growth, histological characters, and infective properties, may be regarded as truly tuberculous, certain rod-shaped bodies, reacting to special staining agents, are to be found. This is true of animal as well as of human Tuberculosis, and the number of separate observations is large enough to infer that the association is constant. Even in the two exceptional cases in which the pus of tuberculous abscesses (one spinal, the other renal) contained no bacilli, the probability that the diseased source of the pus contained bacilli amounted almost to certainty. These bacilli have never been found in other diseases, and statements to that effect must be set down to erroneous observation or incorrect application of methods of research. The bacillus occurs in the very earliest formations ; it seems to induce cell-accumulation, giant cell formation and ultimate destruction of these elements. The presence and number of bacilli are undoubtedly connected with the rapidity of the progress of the disease. These facts point to more than a merely concomitant relation, and necessitate the further study of the life-history of the bacillus, which can only be done by methods pursued in the investigation of other bacterial diseases, by isolation of the organism and its cultivation outside the body. To this subject he then applies himself, and we regret that space does not permit us to detail the methods employed for this purpose. After that he describes at length the infection experiments—first, those made by inoculation with tuberculous tissues ; and, secondly, those made with pure cultures of the bacillus. These latter include inoculation of the anterior chamber of the eye, of the peritoneal cavity, intravenous injection, and experiments of inhalation. We know the results of this research, and how upon it the doctrine of *contagium vivum* in Tuberculosis has been based.

In conclusion, we should like to dwell upon the final pages of this monograph, in which the whole bearings of these researches are summed up. The fact that the tubercular bacillus can only grow under certain conditions (in blood serum and flesh infusions, and at a temperature above 30° C.), which are only obtainable in the living body—that it is, in fact, a true parasite, and not an occasional parasite like the Anthrax bacillus—is so far encouraging, as affording more hope from prophylaxis. Nor is there any evidence that a harmless, non-pathogenic bacterium can ever develop into this specific kind ; but there is also little ground for hope that the virus can be "attenuated." The bacillus has been shown to retain its infective properties for

very long periods, even in the presence of decomposition. Pulmonary Phthisis and Tuberculosis of the domestic animals are the diseases which maintain the contagium, and in Phthisis the sputa form the chief medium of transference. No doubt the bacillus is inhaled with dust, and, like dust, may remain in the air-passages, or be taken into the alveoli ; but its further development depends upon many conditions, one of which is its slow growth. Under certain circumstances, when the bronchial mucous membrane is denuded (as in measles), or when, from adhesions, defective formation of chest walls, etc., there is a tendency to stagnation of air and accumulation of secretion in parts of the lung, there is greater likelihood of the parasite taking root. But it is quite possible that the bacillus may sometimes gain entrance into the body in other ways—*e.g.*, in water, since it has been found in the intestinal evacuations ; and he believes cases of lymphatic tubercle are often due to the virus gaining entrance through abrasions. The second source of the tubercular virus concerns its entrance with food, as in consumption of the flesh or milk of tuberculous animals. That this is far less frequently the source of human Tuberculosis seems clear from the comparative rarity of primary tubercle of the alimentary tract ; and it seems also, from facts of intestinal infection in cases of Phthisis, that this requires the introduction of spores, which resist the action of the digestive juices more than the bacillus itself. The same applies to milk, and, moreover, this secretion only contains bacilli when the mammary gland is itself tuberculous, which is rare. When the bacillus has gained entrance into the body, whether by wounds of the skin, by inhalation into the lungs, or by the alimentary tract, it excites cell-formation, and subsequent necrosis where it lodges ; and the morbid process extends probably through the medium of the "Wander-cells" of the tissue, until the action of the parasite they convey brings them to a stand ; and wider extensions are readily explained by means of the lymphatic and blood-streams. The identity of the various forms of tubercular disease in man must be admitted ; and although positive proof is yet wanting, it is right to act on the doctrine that the human disease is identical with that which is manifested so variously among the lower animals. Differences in the manner of invasion, in the organs affected, and in the proclivity to the disease, must be attributed to individual predisposition, and to the conditions surrounding each case. Often such "predisposition" is explicable on anatomical grounds ; and it is to be noted that the disposition to become the seat of the disease may vary at different periods in the same individual. As to heredity, for which little support is given in the rare occurrence of congenital Tuberculosis, Koch briefly dismisses it as an argument against the infective theory, by asserting that it is the "disposition," and not the disease, which is transmitted. This infective theory, he repeats, is not new ; it has only been confirmed by these researches. Its acceptance, and the evidence that Tuberculosis is dependent on a parasite, demand energetic study of therapeutic and prophylactic measures, although on the former head there is less reason to hope for success than on the latter. But, although prophylactic measures are needed, the wide distribution of the disease requires that all endeavours in this direction should take into account social relations, and one must carefully inquire in what way and how far such measures may be carried out without undue disturbance and injury. He reserves for another time the further development of these considerations.

THE BACTERIA OF SWINE PLAGUE.

BY E. KLEIN, M.D., F.R.S.

IN a paper read before the Royal Society on February 17th, 1878, I have described in a summary way the results of observations on the etiology of an acute infectious disease affecting swine to a very large extent in this and other countries—Swine Plague or Swine Fever, Pig Typhoid or Pneumo-enteritis, or Hog Cholera. I have shown that the lungs, intestines, and serous membranes are constantly and severely diseased, and that particles of these organs are capable of starting the malady by inoculation into healthy pigs. I have also shown that infection is easily carried out by means of the air, and that the essence of the virus is a rod-shaped micro-organism, a bacterium; this I had cultivated artificially outside the body of animals, and with such artificial cultures I was able to produce infection. The bacterium, as cultures had proved to me, belonged to the species of bacillus, motile, very minute, and capable of forming spores.

In a detailed memoir (*Reports of the Medical Officer of the Local Government Board*, 1877-1878) I have given a minute account of the pathology and etiology of this disease, and have there also stated that it is capable of transference by inoculation to some rodent animals, notably tame mice and rabbits. In 1882 M. Pasteur published the results of observations on this malady in France (*Comptes rendus*, No. 23, 4th December, p. 1,120), maintaining that the essence of the virus of Swine Fever (mal rouge, rouget) is not a rod-shaped bacterium, but a dumb-bell of micrococcus, similar to that of Fowl Cholera: "Sa forme est encore celle d'un 8 de chiffre, mais plus fin, moins visible que celui du cholera (des poules)."

That in Swine Plague micrococci do occur very abundantly as dumb-bells and as zoogloea, of that fact I was well cognisant, and I have minutely described their occurrence in the ulcerations of the large intestines, the lung and pleura, in the ulcers of the tongue and larynx (*Reports of the Med. Off. of the Loc. Gov. Board*, 1877-1878), but I have not attributed to their presence any but secondary importance.

In a second communication, M. Pasteur (*Comptes rendus*, No. 22, November, 1883, p. 1,163) tells us that the microbe of the Swine Fever was discovered by his assistant, the much lamented M. Thuillier—whose very beautiful researches with M. Pasteur on the bacillus Anthracis justly won him the estimation of his French and foreign colleagues—in cultivations made from the blood of pigs suffering from Swine Fever; that this organism is a dumb-bell of micrococcus (*en chiffre* 8); that cultivations in beef-broth yielded a virus which produced Swine Fever; that rabbits and pigeons are very susceptible to this disease—in fact, in some departments of France these have died out through infection from swine; that rabbits inoculated with the cultivated virus die, that also pigeons inoculated with the virus die under exactly the same symptoms as when inoculated with the micrococcus of Fowl Cholera; that when the cultivated virus (*le microbe du rouget du porc*) is passed through several rabbits in succession it becomes attenuated, not as regards rabbits, but as regards swine; so much so that using it now to inoculate pigs, it will be found that while they become slightly ill, they nevertheless do not die, but remain immune against the virulent disease.

These are in substance the assertions made by M. Pasteur; they are, as is evident to every worker in this field of the relation of micro-organisms to infectious diseases, of the greatest importance. It is therefore greatly to be regretted that M. Pasteur has not embodied in his paper the details of his observations, for on analysis it will be seen that beyond his bare assertions, which no doubt appear to him quite justified from his observations, there is

for the worker nothing to go by. It is exceedingly difficult to judge what he really has observed. There is no description given of the pathology of the disease in rabbits as compared with that of the pig and pigeon, there is no description given of the malady provoked by his attenuated virus, nor of the test to which he subjected the pigs inoculated with his attenuated virus, *i.e.*, the virus that had passed through a succession of his rabbits, beyond the publication of two letters by the owners of the "vaccinated" animals that these animals have not succumbed to the malady, although others in the same district, not previously inoculated, had succumbed.

It is impossible to say whether these rabbits had really the Swine Fever, or died merely from septicæmia. It would have been important to find, also, a statement what the mitigated malady in the pigs, inoculated from those rabbits, was: what was the course of the temperature; was there any swelling in the glands near the seat of inoculation? I have seen a good many pigs inoculated with culture of the bacterium of Swine Fever, which, beyond the swelling of the glands and beyond a transitory rise of the body temperature on the second and third day, by one or even two degrees C., showed no other signs. Had I omitted to inspect the glands near the seat of inoculation, and had I not taken the temperature regularly, I should have been unable to recognise the malady.

At the outset it seemed to me probable that, as in the case of the microbe of Fowl Cholera, M. Pasteur did not work with pure cultivations of the microbe of the Swine Fever, viz., that he worked with cultivations in which there were very probably the specific microbes and an accidental contamination, probably a dumb-bell form of micrococci. The first, *i.e.*, the true microbe of Swine Fever, M. Pasteur has overlooked, as I shall presently conclusively prove, the other he has seen and taken for the specific microbe. This other or accidental microbe is probably the microbe of Fowl Cholera, or a similar organism. For how is it, I would ask, that the pigeons that he inoculated with his cultures died under symptoms and with anatomical lesions identical with those of Fowl Cholera, whereas *all inoculations of pigeons* that I have made with virus directly derived from the diseased swine—diseased lung, diseased bronchial glands, *i.e.*, virus which invariably produces the disease in swine and in other susceptible animals—and with my artificial cultures of the organism of Swine Fever, *produced absolutely no effect, neither local nor general?* Surely only because the cultures that M. Pasteur experimented with contained something different from, something additional to, the virus of Swine Fever. Had Pasteur inoculated pigeons directly from the pig, ill or dead from the disease, which he, strange to say, omitted to do, he would have at once convinced himself that pigeons are not susceptible to Swine Fever. That his rabbits may have died from the Swine Plague is possible, but it is more probable that, like his pigeons, they died of a septicæmia produced by the *microbe en chiffre* 8. This M. Pasteur ought to have taken into account, particularly by reason of his previous observations of the great susceptibility of rabbits to a microbe of this kind, which he cultivated from saliva of a child suffering from Hydrophobia, and which microbe he thought, quite erroneously, as is now well known, to be the virus of Hydrophobia.

Of the rabbits which died in consequence of inoculation with his cultures of the microbe of Swine Plague, no description whatever is given, neither are the symptoms of the disease nor the anatomical appearances found after death.

That rabbits are susceptible to the disease, this I had proved in 1877 by inoculation with material directly derived from the pig, and I have described in detail the pathological appearances presented by these animals.

In the same memoir I have also given a detailed description of experi-

ments on mice—which are still more susceptible to this malady—both after inoculations with the virus directly derived from the pig, as well as with the artifically cultivated virus.

Of a microscopic examination of the tissues of the animals dead of the disease there is of course no mention made, a proceeding which M. Pasteur appears to consider as altogether superfluous.

Owing to these statements of M. Pasteur I have made many new experiments of artificial cultivations of the micro-organism of Swine Fever, and I will describe here the results of these experiments, and also of new observations made on the diseased organs prepared with the new methods of anilin-staining. In this last part of the inquiry I have been very ably assisted by my friend Mr. A. Lingard, to whom my best thanks are due.

These observations were made incidentally to my work on air-disinfection in Swine Fever, which work I am carrying on for the medical officer of the Local Government Board, in whose reports these experiments will be published in detail.

1. *Examination of diseased organs of pigs dead of Swine Fever.*

(*a*) As I have mentioned in my former report, in the bronchial exudation, in the juice of the lung tissue, in the peritoneal exudation, and occasionally, but not generally, also in the blood, minute rods can be seen already in the fresh state. Preparing sections through the typically ulcerated mucous membrane of the large intestine, staining these in anilin dyes, and examining them under the microscope, I find this: In the superficial parts of the necrosed membrane are present large numbers of micrococci of various kinds, chiefly varying in the size of the elements and in the mode of aggregation, some being small, and forming an irregular zoogloea, others being two and three times larger and aggregated in small clumps. These micrococci stain well in Spiller's purple and in methyl blue, and are present only in the necrotic parts of the ulceration, in which they appear irregularly distributed. But in the depth of the tissue, and extending in many places into the inflamed submucous tissue, are seen streaks and clumps of minute rod-shaped bacteria, which coincide as regards size (length and thickness) with the bacilli which I described in my former memoir, the single organisms being about 0·001 to 0·004 mm. long, and about a third or a fourth as thick. They are occasionally seen forming a chain or linear series. In some places they lie closely together in groups, and many are seen in optical section, and then it is necessary to be careful not to confound them with micrococci. They stain well and conspicuously with magenta.

(*b*) Sections made through the fresh or hardened swollen mesenteric and inguinal lymph-glands, and examined in the same manner as the intestine, reveal the presence of clumps of the same minute rod-shaped organisms as in the intestine. They are chiefly aggregated in a peculiar manner; in a few places they are scattered irregularly through the tissue, but are chiefly contained in what appear to be capillary vessels and minute veins. Looking at a clump of these organisms, one imagines them at first to be a zoogloea of micrococci, but using oil-immersion lenses and Abbe's substage condenser it becomes certain that they are undoubted rods, some smooth and uniform, others more or less beaded. As a rule, when one has before one a small blood-vessel filled with them and cut across, the rods look like dots, but in a vessel cut longitudinally or in the tissue itself there is no difficulty in ascertaining that they are distinct rods.

(*c*) Sections through the diseased parts of the lung reveal in preparations stained as above, the presence of large numbers of micrococci in the cavity of the bronchi and air vesicles, but not in all lungs, since I have found lungs in which they were altogether absent. But there are always present in smaller or larger clumps the same minute rod-shaped organisms as mentioned above.

They are embedded in a coagulum filling the air vesicles or they block up a blood-vessel in the wall of a bronchiole or air vesicle. In the air vesicles I have seen exudation cells, white blood corpuscles containing clumps of the rods; they are well brought out by Spiller's purple. In the air vesicles of some lungs I have seen them grow to very long chains,—leptothrix, ten, twenty and more times the length of the single rods. These rods were present not only in the air vesicles, but also in the tissue itself, both of the walls of the air vesicles as well as of the smaller or larger bronchi.

(*d*) In sections through ulcerations of the mucous membrane of the tongue—these ulcerations do not occur commonly in Swine Fever, but in isolated cases I have seen and described them, as well as ulcers in the larynx (see my *Report to the Med. Off. of the Loc. Gov. Board for* 1877)—I have seen in the superficial parts of the ulcers large clumps of micrococci, but in the depth of, and extending between the inflamed muscular tissue, I have found the same rod-shaped organisms as mentioned above; they are chiefly in spaces between the bundles of the inflamed connective-tissue, forming here streaks of longer or shorter chains.

2. *Examination of diseased tissues of mice and rabbits.*

In the juice of the diseased lung, in that of the liver and spleen, the minute rods can be seen already in the fresh state, in the heart's blood only occasionally. Sections through the diseased organs (spleen and liver) of mice and rabbits dead of this disease, produced either by inoculation with the virus of diseased organs of the pig, or with the diseased organs of a mouse or rabbit dead of this disease, or with artificially cultivated virus, show on microscopic examination the presence of the same rod-shaped bacilli mentioned as present in the organs of the pig. The juice of the enlarged spleen of a mouse or rabbit (see below) reveals already in the fresh state, but still better in preparations made after the Weigert-Koch method of drying a thin film of the juice on a covering glass and staining with Spiller's purple, or better still with gentian violet, the presence of beautiful minute bacilli; they are also well seen in sections through the spleen and the diseased parts of the liver. As I shall presently mention, the liver of mice dead of the disease is in most instances altered in a very striking and characteristic manner, there being present large numbers of minute whitish specks and streaks more or less confluent and chiefly due to coagulation—necrosis of the liver tissue. These changes are especially abundant near the anterior margin, so that often the tissue of this part is almost entirely necrosed. In the earlier stages masses of the liver cells near the central vein of the acini are necrosed, later on also the capillaries between them become transformed into hyaline or fibrous bands. In these necrosed parts we find in some cases the blood-vessels—capillaries and small veins filled with continuous masses of micrococci, staining readily with Spiller's purple and methyl blue, but in sections stained, *in addition, with magenta* we found scattered amongst the micrococci, especially at the margin of the necrosed parts, beautiful masses of the same rod-shaped organisms as mentioned above, either singly or in chains of two, three, and four, or in small groups. This fact is so striking that even a superficial observer cannot help noticing it. Single rods, or two or three, are found also independent of blood-vessels, between and in the liver cells themselves. They measure between 0·002 and 0·005 mm. In other cases no micrococci are to be seen, but the liver cells of the necrosed parts, or those at the boundary of necrosed parts, contain beautiful groups of the rods; they stain well in an alcoholic solution of magenta.

I have seen the same rods, singly and in small clumps, in the Malpighian corpuscles of the kidney; the capillaries of the glomeruli are impermeable, being transformed into hyaline or slightly fibrous bands.

3. *Artificial cultivations.* I have made the following artificial cultivations.

(*a*) A capillary pipette recently made and drawn out at one end into a very fine point like a needle, is pushed with this end well into the diseased organ, lung of pig a short time dead of the disease, or into the bronchial gland of the pig, or better still into the spleen or liver of a mouse or rabbit recently dead of the disease; the surface of the part to be used is previously washed after Koch's method with a solution of perchloride of mercury deadly to all micro-organisms. By squeezing the part a small quantity of juice is easily pressed into the capillary pipette. This is then withdrawn, and the fine pointed end is pushed through the cotton wool plugging the mouth of a test-tube containing sterilized material to be inoculated with the fluid. Cotton wool, test-tube, and nourishing material are reliably sterilized.

The cotton wool plug is before inoculation just slightly drawn up, but not lifted out, and immediately pressed down again into its former position, when after inoculation the capillary pipette is withdrawn.

As nourishing material there are used: chicken broth, rabbit broth, solution of peptone (two parts of beef peptone, two parts of cane sugar in 100 parts of distilled water), fluid Hydrocele exudation, solid Hydrocele exudation (solidified by evaporation), Agar Agar and peptone (solid). Of these materials I found for this and similar cultures of the organism of Swine Fever, such as will be presently described, chicken broth, rabbit broth, peptone solution and solid Hydrocele exudation very suitable, the others not quite so good.

(*b*) From blood of a diseased pig. A pig had been inoculated with an artificial culture, which as tested on mice and rabbits contained the active virus. The temperature of the pig rose twenty-four hours after inoculation from 39° to 39°8, after forty-eight hours it rose to 40°2; in this stage blood was obtained from the vein of the ear and with this blood eight test-tubes with sterilized nourishing material were inoculated in the manner above stated. After exposing the test-tubes in the incubator for several days, no growth of any kind of organism made its appearance. The temperature of the above pig fell on the fourth day to 39°8, but on the fifth day rose again to 40°4. On this day again blood was withdrawn and with it inoculations of artificial cultures were made, but with no success. After several days' incubation at a temperature of 35° C. no growth whatever had made its appearance. [That the fluids inoculated with this blood were suitable for the growth of the organism of Swine Fever, is proved by the fact that these same tubes were afterwards inoculated with cultures containing the organisms, and of course a copious crop was the result.]

(*c*) I have been more successful with the blood of rabbits ill with, or dead from the disease. But I have had failures in some cases. In the first instance the pointed end of a capillary pipette is inserted into a vein, in the second, the pericardium is opened, the pointed end of a capillary pipette is pushed through the wall of the right ventricle or auricle into the cavity of the heart, and a quantity of blood is thus obtained.

The inoculation of sterilized material in test-tubes is then performed as above. In many instances, after incubation for twenty-four hours, I have obtained a copious growth of the organism of Swine Fever. But in other instances the inoculation with blood did not produce any growth.

In all instances of successful inoculation, the fluids inoculated and kept in the incubator at 30-42° C. (best at 35-40° C.) became after twenty-four hours uniformly turbid, there being present multitudes of minute rods, actively moving, spinning about, darting to and fro.

An exception was met with in the cultures made from the diseased lung of the pig, for in these there were present, besides the typical rods, also numbers of micrococci and some long thin bacilli.

I have made successful inoculations by the dozen, and have found invariably the same organism: minute rods, in active motion, such as is observed

in the case of septic bacterium termo and of bacillus subtilis. M. Pasteur has entirely overlooked this organism, otherwise he could not have failed to notice its motility. Most of the rods are single, some are double, one placed behind the other, or sometimes these are found in a chain. They are rounded at their ends. In length and thickness they coincide with the rods described above as found in the tissues of animals dead of the disease.

After forty-eight hours' incubation the number of the rods is increased, and there is to be seen at the bottom of the fluid a small amount of a whitish precipitate, made up entirely of the rods, but not moving. After three or four days' incubation the fluid is still uniformly turbid, but the amount of deposit is increased, and there is an indication, on the surface of the fluid, of a pellicle, in the shape of minute whitish specks closely placed and confluent in many places, especially where the fluid is in contact with the glass.

This pellicle consists of moving and non-moving rods, some twice, thrice, and four times as long as others. Some are 0·005 mm. long.

On the sixth day of incubation the number of rods increases, the amount of bottom deposit is greater, and the pellicle on the surface is more distinct and coherent. In the fluid are only a few moving rods; this condition is still more pronounced on the seventh and eighth day, there being now hardly any moving rods visible.

The longer rods include either at one end or both, or sometimes also in the middle, a bright granule having all appearances of a spore, the rods themselves being composed of a very pale substance.

Fresh cultivations are made with these cultures; they are all successful, and give precisely the same results. The pointed end of a capillary pipette is pushed through the cotton wool plug of one of these test-tubes into the fluid, a small quantity ascends into the pipette, the pipette is withdrawn, and with it a second, from this a third, from this a fourth, from this a fifth cultivation is established.

The rods we have to deal with in these cultures cannot be bacterium termo, since they are twice and three times as long as the known bacterium termo; besides, the larger examples are really single rods, since staining them with anilin dyes does not reveal any differentiation. The shortest examples might be taken for bacterium termo, since in them the length is not more than once and a half or twice the thickness; but the larger examples are four, five, and more times longer than they are broad. That we have to deal with one species only is proved by there being present all intermediate forms between long and short rods, and chiefly by the fact that new cultures made from them invariably yield in the first twenty-four or forty-eight hours the same kind of rods, *i.e.*, motile, and all of the same length.

Measurements which I have made on several preparations showed the following:—

In a fresh specimen made of a III. culture on the third day of incubation, started with the spleen of a mouse dead of the disease, the rods varied in length between 0·0036 and 0·0054 mm., their thickness being about a third to a fifth of this.

In a specimen made of a similar culture, after forty-eight hours' incubation, but dried and stained, the rods measured in length between 0·002 and 0·0026 mm.

The rods in a section of the hardened liver of the same mouse were ·002 mm. in length, or a little more.

Solid nourishing material, such as hydrocele fluid solidified by evaporation, when inoculated on the surface, yields the same rods; after two or three days' incubation, a whitish film appears on the surface of the material, which during the next days increases in thickness and breadth. This film is

composed of the same rods as above, some motile, others not; many of them appear granular after several days' incubation.

I will readily admit that the rods seen in the diseased organs of the pig, mice, and rabbits, as well as those of the artificial cultures of the first day or two, may be regarded as bacterium termo, but against this I have to mention that there are amongst them rods, which by their length most certainly correspond to bacilli; this is well seen in preparations made of the fresh spleen and liver after the Weigert-Koch method, and also in those of the artificial cultures after the second day's incubation; besides, the presence of spores in the longer rods decidedly shows that they are bacilli, and not bacterium termo.

4. Two pigs have been hitherto inoculated with artificial cultures—one with a second culture derived from the swollen bronchial gland of a pig dead of the plague, a second pig with a third culture derived from spleen of a mouse dead of the disease.

In both cases, after an incubation of two days, the inguinal glands near the seat of incubation became swollen, and this swelling increased in the next days to a considerable degree.

The temperature rose first by one, then by another degree-Celsius, fell then to its normal height, but on the seventh day rose again a degree, and kept so for a day or two. During the first rise of the temperature the animal fell slightly off in its feeding, but when the temperature fell it fed again all right. In the third and fourth week the animal seemed right, except for the swollen inguinal glands. But from my former investigations (*Reports of the Med. Off. of the Loc. Gov. Board*, 1877-1878, p. 218), I know that if such an animal is killed the lungs and intestines are found diseased to a degree that one would not have imagined from the look of the animal while living.

Inoculations into the subcutaneous tissue of mice and rabbits: with the fresh particles of diseased lung and bronchial glands of the pig; with cultures made of the bronchial gland of the pig; with spleen and liver of mice and rabbits dead of the disease; with cultures started from blood and spleen of mouse and rabbit and carried on artificially in the test-tube through several generations, invariably produced a typical disease ending in death. In pigeons, however, I have not in a single instance seen any local or general effect.

Mice inoculated subcutaneously with an infinitesimal dose of the natural or artificially cultivated virus show, after about twenty-four hours' incubation, redness and swelling at the seat of inoculation. But they remain in apparently perfect health, as regards movement and feeding, for the two or three days following the inoculation. On the fifth or sixth day they become quiet, their eyes appear partly closed, they do not feed well. Some hours later they are dying, their power of movement is greatly impaired, their backs curved, their hairs are erect, the eyes almost closed, their body feels cold, and their respiration is superficial and slow. Death occurs between the fifth and seventh, rarely on the eight or ninth day.

On *post-mortem* examination the following appearances are noticed: the seat of inoculation is discoloured, no œdema; inflammation of the small intestine (jejunum and duodenum); occasionally peritoneal exudation; spleen several times enlarged, dark, firm; kidneys dark, enlarged; liver enlarged, uniformly permeated by minute whitish points, which in some parts, notably near the inferior margin of the organ, are confluent into whitish masses. In a well pronounced case these masses are numerous and anastomose with one another. The lungs show hæmorrhage, and in most instances smaller or larger parts of the lobes are intensely inflamed, being in a state of red hepatisation.

Rabbits inoculated with virus (natural or artificially cultivated) show a rise

of temperature on the second day; this rise amounts to one degree of Celsus. On the third day the temperature rises another degree. On the fourth day the temperature rises again by one-half to one degree, and it keeps high till about twenty-four hours preceding death, when it gradually sinks below the initial normal temperature, and then death is imminent. The animal becomes slow and quiet, its eyes become partially closed, and death soon follows. Death occurs in most cases between the fifth and seventh or eighth day.

On *post-mortem* examination the seat of inoculation is occasionally red, and occasionally there is slight hæmorrhage, no œdema; peritonitis with copious exudation is not uncommon; hæmorrhages under the serous covering of the large and small intestine are often seen, in some instances the first part of the duodenum shows copious hæmorrhage in all coats; the spleen is constantly several times enlarged, dark and firm; the liver is enlarged and shows exactly the same pathological appearances as in the mouse. The kidneys are enlarged, dark, occasionally there are hæmorrhages under the outer capsule. The lungs are generally inflamed, and there are hæmorrhages in minute points under the pleura; in many cases large sections of lobes are in a state of red hepatisation; there is generally pericarditis, occasionally there are hæmorrhages under the visceral layer of the pericardium.

These *post-mortem* appearances in mice and rabbits have been described already in my Memoir in 1877, but then I had not so large a number of successful cases as I now have.

I know of no acute infectious disease, except Anthrax, in which the pathological appearances as regards spleen, liver, and lung occur with such constancy as in mice and rabbits inoculated with natural or artificially cultivated virus of Swine Plague. It is hardly necessary to say that this disease is in no way related to Koch's Septicæmia in rabbits and mice. The course of the disease, the pathological appearances, and the organisms, are totally different in the two diseases.

Inoculations of test-tubes containing sterilized nourishing material made in the manner above described from the spleen of a mouse or rabbit dead of the disease—blood is also good, but not quite so reliable—has invariably yielded a copious growth of the typical motile rods, and these have been cultivated through several generations. Each culture when used during the first week of incubation for subcutaneous inoculation invariably produced death in mice and rabbits between the fifth and seventh or eighth day, with the typical *post-mortem* appearances.

With reference to M. Pasteur's statement that, passing the virus of the pig successively through several rabbits, its activity becomes attenuated as regards the pig, I have as yet had no experience, but I hope soon to be able to test it. However, I should like to point out that pigs inoculated with artificially cultivated virus (derived from the pig, or mouse, or rabbit), although becoming ill, do not die; this I have pointed out in my former Memoir, and also that a good many pigs inoculated with dried virus derived directly from the pig do not die. And it is quite possible, as in Pasteur's cases, that the virus of the rabbit (and also of the mouse) fatal to these animals is not fatal to pigs. But whether pigs after recovery from this illness are not capable of contracting a second fatal attack, as Pasteur maintains to be the case, must be proved by direct experiment.

M. Pasteur, however, has first to show, which undoubtedly he has not shown as far as I can make it out, that his rabbits did die from Swine Fever and not from Septicæmia; further he has to show, which he has not shown that his pigs inoculated with the virus derived from the rabbit had a mild form of Swine Fever; and lastly, he has to show that such pigs, when re-inoculated with virus derived from the pig, do not show any alteration, that is, neither swelling of lymph-glands near the seat of inoculation,

nor rise of temperature; that they do not die, does not prove anything, since many pigs not previously "vaccinated" do not necessarily die of the disease.

I hope soon to be able to ascertain whether or not healthy pigs, when inoculated with virus that has passed through the mouse or rabbit, behave differently from those inoculated with virulent material directly derived from the pig dead of Swine Fever, but *a priori* there is no impossibility in such a difference existing; that is to say, it is quite possible that the virus becomes hereby weakened, as regards pigs, but not as regards mice and rabbits. We know now, that while sheep die of virulent Anthrax when inoculated with ordinary cultures of bacillus anthracis or its spores, or with bacillus anthracis derived from sheep or cattle dead of the disease, they do not die, but only suffer a passing illness, when inoculated with this virus after having passed through a white mouse, this last animal dying from it (Klein and Roy). And also we know from the experiments of Dr. Burdon-Sanderson and Mr. Duguid, that cattle inoculated with Anthrax bacilli first passed through the guinea-pig do not die, but only suffer a non-fatal form of the malady; and, lastly, from the experiments of Dr. Roy we know that Anthrax virus having passed through the South American biscachas does not kill cattle, these becoming ill of a non-fatal malady. All such animals, *i.e.*, sheep inoculated with Anthrax blood of white mouse, cattle inoculated with Anthrax blood of the guinea-pig, and cattle inoculated with Anthrax blood of biscachas, are for a time at least unsusceptible to a fatal attack of the malady.

Addendum.

I have recently satisfied myself that the artificial cultivation of the virus in the organs (spleen, liver, lung) of mice or rabbits inoculated from diseased swine, will produce a mild form of Swine Plague. The temperature rises 1° or 2° (Cent.) from the second day after inoculation, and continues so to about the eighth or tenth day, during which time the appetite is diminished; after which the animal quickly recovers. So that by inoculating pigs with the artificial virus obtained from mice and rabbits, they can be protected from the disease.

EVERY-DAY MATTERS IN AN INDIAN MILITARY VETERINARY PRACTICE.

BY J. H. STEEL, M.R.C.V.S., A.V.D., IN VETERINARY CHARGE, R.A., H.S.F., SECUNDERABAD (1882-3).

(*Continued from page* 431, *vol. xviii.*)

Pleuro-pneumonia, possibly Rinderpest, and certainly Tuberculosis, are very rare in the neighbourhood of Secunderabad. The latter disease does occasionally occur, but not nearly so often as is imagined, calcified hydatids detected in the lungs, *post-mortem*, being considered and described as tubercles. This is a fact of interest, and is probably in direct relation to non-prevalence of "inter-breeding," to the absence of cattle of very fine milking qualities and highly bred, all of which conditions we must deem predisposing to invasion by the bacillus of tubercle. With regard to Actinomycosis, now proved by recent observation to be the pathological state manifested in the form of "Cancer or Tubercle of the tongue," "Clyers," and other affections familiar in England, I have records in my note-books of several cases of *peculiar fibroid tumours of the skin* of Amrut Mahal cattle. They vary considerably in size, and are most frequent in the dewlap. Sometimes they

extend root-like prolongations from the central main tumour. Occasionally they suppurate and discharge a very little pus. They are obstinate under treatment. I have excised them and the operation has not been followed by recurrence; I am not sure whether or no they are Actinomycosis. They are considered by the natives a form of Scrofula; Gilchrist gives an interesting account of them, but describes them as essentially *glandular*, whereas I have found them *cuticular*. They may be allied to the Lincolnshire disease known as Clyers. I had to do with one case of enormous ulcer of the skin of the shoulder, which, from its obstinate character and persistent superfluity of growth, I ultimately decided to be Cancer. I was to an extent confirmed in this diagnosis by the fact that the animal was suffering from an abnormal growth on the nictitating organ—a sort of EPITHELIOMA OF THE CONJUNCTIVA—first appearing on the conjunctival membrane of the haw, subsequently invading that of the front of the eyeball. I lay stress on this affection, because I have reason to consider it very frequent in the Amrut cattle, in which it is probably the result of hereditary transmission; often these tumours can be dragged off by grasping firmly between the finger and thumb, but they recur after such rough removal. The enormous strength of the retractor oculi, and the thickness of the eyelids, render them almost unremovable by ordinary surgical methods. Altogether, I have found them most unsatisfactory to treat.

ICTERUS OR JAUNDICE is a condition very frequently seen among the cattle in this country, especially those imported from England, Australia, or even Aden. Within a few days of one another, a short time ago, I had two cases of Acute Jaundice, following a longish period of obscure disorder. In both, on autopsy, I found enormous distension of the biliary passages, with thickening of their walls, and occlusion of the opening of the bile-duct into the bowels. The bile in the passages contained much brick-red grumous matter, and in one case the cholocyst contained a very large calculus of concentric laminæ, softest on the surface. I have not observed flukes in the liver of cattle in this country—indeed, I think *Fascioliasis* is rare even among sheep out here. Certainly the healthiness of the livers of sheep in the Madras slaughter-houses, and the Commissariat Abattoir at Secunderabad, would astonish an English butcher. The most frequent abnormality of the liver, lungs, and spleen is ECHINOCOCCUS INVASION, which seldom causes appreciable disorder, but occasionally is in direct relation to an attack of disease. Although ANTHRAX is undoubtedly largely prevalent among the cattle of India, it is not very often seen in transport bullocks during time of peace. It is said to cause sad havoc at times in the Hoonsoor Depôt: Splenic Fever and Gloss-Anthrax are the forms it most generally assumes. I have had to do, on one occasion, with MALICIOUS POISONING OF CATTLE by the chucklers (shoemakers), with a view to procuring the hides for trade purposes. This is a matter of great importance to the cattle pathologist in India, and has been extensively dealt with in home and Indian veterinary literature recently.* The most important bearings of this crime are:—

(1) The necessity for exact differential diagnosis between Anthrax and poisoning of cattle by vegetable narcotics.

(2) The liability of cattle-poisoners to cause widespread destruction during the prevalence of severe Cattle Murrain.

(3) The liability of such cases to complicate disease statistics.

(4) The veterinario-legal aspects of the question.

The fresh arrival in India is at once struck by the frequency of FIRING OF BULLOCKS. The poor creatures seem scored all over with the hot iron,

* *Vide* VETERINARY JOURNAL, "Quarterly Journal of Veterinary Science in India," "Plain Hints on Cattle Diseases in India" (Mills), "Cattle Plague Commission Report" (Hallen)

fancifully and in neat patterns, no doubt, but to a degree which would excite immense wrath in the heart of a "cruelty agent." Yet this infliction, although indulged in without the slighest consideration for the animal's feelings, is not without objects: *Firstly*—The skin is thereby rendered unfit for the chucklers, and the animals will neither be poisoned nor given specific disease for the sake of the hide. *Secondly*—The natives like to adopt heroic and visible treatment, and fire for almost all diseases, "they fire sometimes in spots, or in straight lines, or curved along the spine, or on the flanks, and generally terminating trilinearly or forked. To this mode of termination of the lines they attach, though needlessly, great importance" (Gilchrist). *Thirdly*—Some of these marks have a religious significance. The Hindoos worship the cow, and the god Siva used to ride about on a bull, of which the figure may be seen in connection with many of the temples. The religion of the Hindoos has, indeed, some curious bearings on veterinary science in this country. In Bombay and other parts may be seen pindrapoles and other refuges for destitute, sick, and infirm animals, richly endowed by legacies of the pious. Here may be seen most extraordinary specimens of disease, many of the victims to which would, according to our western notions, be much better put out of their pain. But the Hindoo, however much brutality he may exercise on cattle, whether intentionally or, as generally, through pure thoughtlessness, draws a line at removal of life! The bullock man on festive occasions paints the horns of his bullock, decorates them with tassels, hangs charms round the neck, and otherwise makes him look very gorgeous.

Brahminí bulls may still be seen in the streets of some of the principal centres of Hindooism. Often they are much overfed, as they wander through the bazaar and obtain grain from the pious, both purchasers and vendors; often also they have loathsome disease of the genitals through dirt and abuse of the sexual powers. Probably the diminution in the number of these bulls, in consequence of the decline and subjugation of Hindooism, has much to do with deterioration of the races of cattle which, we are told, has taken place in India of late years. A Hindoo stock-owner would give up his most promising bull-calf to the priests, and this, highly fed by offerings, would attain a large size and "cover" the villagers' cows free of expense—begetting a large and healthy progeny. Deformed cattle (which are frequent in India, especially polymelians), are highly reverenced. *Fourthly*—It seems that cattle are sometimes fired simply for ornament. The driver often takes very much pride in his bullocks, and is very fond of them, and they of him. Nevertheless, we somewhat frequently find animals worked with very severe YOKE-GALLS, the pathology of which has an important relation to the question of cruelty. The pathological states of yoke-galls are as follows:—

(*a*) Recent surface abrasion of the skin of the neck.

(*b*) Serous accumulation underneath the skin of the neck, with existing inflammation.

(*c*) Acute abscess at the seat of yoke-pressure, with severe inflammation.

It is cruelty to work an animal suffering from any of these forms of yoke-gall.

(*d*) "Cold abscess," a sequela of *c*, in which all active inflammation has subsided, and the abscess acts physiologically as a spurious Bursa—a sort of cushion on which the yoke may rest.

(*e*) A true "spurious Bursa" between ligamentum nuchæ and the skin of the neck, absolutely painless, and an adaptation of nature to the comfortable reception of yoke-pressure.

An excess of zeal is apt to lead cruelty inspectors to interfere with animals worked under these two latter conditions, but no professional man could

assert that they are suffering from cruelty. The immediate cause of yoke-gall is overweighting the fore part of a two-wheeled cart, or roughness and improper shape of the yoke-bar. The natives rub the parts freely with indigo; but these injuries require no speciality in treatment. The amount of pus which escapes on incision is something enormous in some cases; fortunately the injury is so superficial that the pus seldom burrows so as to form sinuses, but forms a circumscribed abscess. The pus from cold abscesses, as above described, is generally cheesy in consistence. A pet cruelty of bullock drivers is *tail-twisting*—the unfortunate organs are used as guiding means, and become much distorted and deformed by fracture, exostosis, and anchylosis. Although we find fault with the drivers in respect to *abuse* of the tail, we cannot as concerns its *use*. European drivers seem to be useless for cattle. An attempt was made during the Mutiny to use the bullock batteries with their heavy guns, but failed entirely, as the bullocks were utterly unmanageable by Europeans. I have observed, during the emergencies of the march, a whole team of bullocks continue to obstinately refuse a dead pull over sand or black cotton soil until left entirely to native management, they not being willing to work so long as Europeans were near. This prejudice, and the tendency of bullocks to lie down when put to a dead pull, are the greatest objections to their use for army transport.

I have recorded one remarkable case of *aneurismal tumour at the front of the thorax* in a gun bullock, probably due to pressure on the throat by the lower bar of the peculiar yoke used in gun harness, etc. I have also notes on a case of *recurrent hæmorrhage from a superficial metacarpal vein*, which came on whenever the animal was put to work. This I treated by obliteration with pin suture, but the disorder recurred after a time, and about half a pint of blood trickled away whenever the animal was put to work. SHOEING of draught bullocks is extensively and efficiently carried out. The animal is always thrown, and its feet tied together for the operation. Considering the thinness of horn and general delicacy of the foot of the ox, it is very remarkable that injuries from shoeing are, in my experience, extremely rare. LAMENESS from the effects of work is a very frequent source of inefficiency of draught bullocks. In the old animals "*gummy legs*" and "*overshot joints*" are common, as in horses; *spavins* are frequent, as also are *sprains*, *contusions*, *and other injuries*. The slightly worked bullocks of the heavy batteries are frequently sufferers through playful combats; thus we have to do with *punctures* against the prepuce or anus, or *insertion of a horn up the rectum*, or wherever else it can meet resistance on the sleek, plump surface of the body; *broken limbs*, too, may result in this way, as in a case of fracture of radius and ulna with which I had lately to deal; or the horns may be broken as above described. The hip and shoulder are more liable to extensive injury than are the corresponding joints of the horse; the most frequent cause is falls, especially such as result from the above-described native method of casting these animals for shoeing or surgical operations. Foul in the foot is seen in India as often as at home. It will be remarked that I have not, as yet, said much about internal diseases. These are very rare at Secunderabad, if we except hepatic derangements. As in other animals in this country, the disorders are principally abdominal. I have seen *Fardel Bound*, and a waterman's bullock died of *Hoven* on the march from an over-indulgence in succulent herbage on the banks of a stream. The Government cattle are mostly fed on dry fodder (straw, millet stalks, or hay) with an allowance of gram; they do not therefore suffer very much from stomach and bowel disorders, except during the emergencies of active service. Among the cattle of the country, however, enormous numbers succumb to Diarrhœa and Dysentery, and the various forms of Indigestion, during the hot weather, and to Hoven when sud-

denly supplied with an excess of green grass during the commencement of the monsoon season.* It is apparent that animals out here can be purged by much smaller doses than those at home. Castor oil, so frequent in every part of India, is the common purge, and in 8-$\frac{3}{3}$ doses it acts as a laxative. It does not answer to overdo medicines and surgery in this country with cattle; they seem to lack constitutional resisting power, and readily succumb to shock and disease. They, like most other animals in India, exhibit a tendency to asthenicity in disorders, and the stimulant tonic treatment is, therefore, generally to be adopted. *Loose, irregular, and broken teeth* are of somewhat frequent occurrence, if I may judge from my experience. The determination of the age of Indian cattle presents some formidable difficulties which it will require some accurate observation to surmount. The various shapes and forms of the horns, and their being so often polished and painted, prevent their rings proving a guide to us; as regards the teeth, we have every reason to believe that if we were guided by the conclusions inculcated at home, we would err much in the direction of *over-estimating* the age of Indian animals. SKIN DISEASES are rather frequent, especially among animals recently sent from the depôt, possibly the result of mosquito and other insect torments in the jungle. *Ticks* are the form of parasite most frequently seen in domesticated cattle, from which they extend to horses and any other animals housed near them. Of INTERNAL PARASITES, after hydatids, amphistomes in the stomach and bowels are the most frequent, but do not seem to cause any serious inconvenience. At the recent camp of exercise I had the following two interesting cases (among others) under my professional care:—

(*a*) Canker of the external ear, similar to the disease as seen in dogs.

(*b*) Cystic tumours of small size, like submucous hydatids, inside the external nostrils and the lower lip; nature obscure. Certainly not contagious.

In the above summary of observations, which, I trust, will be found worthy of perusal as original, and in a but little trodden field (that of cattle pathology in India), there will be found strong evidence of the important differences between bovine pathology in England and out here; possibly the draught cattle of Herefordshire, for instance, or of France, Italy, and Austria, may be pathologically more like those of India than our British shorthorns, Kerrys, and so on. What will the country practitioner at home say on reading a paper on cattle disease, in which Parturient Apoplexy, Garget, choking, Hoose, and abortion are not even alluded to, while Hoven, Pleuro-pneumonia, and Fardel Bound receive only a casual notice? Yet in this paper I give my experience as facts have determined it, and I am willing to agree that the observations I have made are very different from those which my previous acquaintance with cattle pathology led me to anticipate. It is evident that differences of climate, work, management, breed, and general uses have so determined corresponding differences under disease of home and Indian cattle as to render the study of bovine pathology in India a special subdivision of the science of cattle disease. We hope that the matter herein given will supplement that already supplied in the writings of Gilchrist, McLeod, Western, Hallen, Mills, and Shortt.

THE NATIONAL VETERINARY ASSOCIATION.

WE beg to call the attention of our readers to the announcement of the meeting of this Association, which appears in our advertisement pages, and to express the hope that they will make an effort to attend in large numbers, in order to assist in discussing the important questions which will be brought forward.

* I have just had a case of *tumour obstructing the pylorus*, causing extensive disease of the rumen.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF COUNCIL, HELD MAY 27TH, 1884.

Dr. G. FLEMING, President, in the chair.

THE following members of Council were present :—Messrs. McCall, Simpson, Wragg, Perrins, Santy, Dray, Whittle, Reynolds, Greaves, General Sir F. Fitzwygram, Taylor, Blakeway, Harpley, Pritchard, Axe, Cartledge, Duguid, and the Secretary.

The SECRETARY read the notice convening the meeting.

The minutes of the previous meeting were taken as read.

Election of President.

Mr. DRAY considered the successor of the then President should be endowed with considerable mental attainments and a cultivated taste, and he thought the gentleman whom he would propose, Professor Walley, possessed those qualities in an eminent degree. His attainments and qualifications were so well known that he (Mr. Dray) need not expatiate upon them, and he was confident that if the Council elected Professor Walley they would not only confer an honour upon him, but upon themselves also in so doing.

Mr. GREAVES said he wished to propose another gentleman in lieu of Professor Walley, and he was prompted to do so for this reason. He was of opinion that the Charter of the College stated that the annual meeting could only be held in Scotland once in three years, and as the next annual meeting could not, under these circumstances, be held in that country, he thought they should postpone electing Professor Walley until the annual gathering could take place there, for then it would be an additional compliment both to the Professor and to the land with which he had the honour of being associated. The gentleman whom he (Mr. Greaves) wished to propose was Mr. Peter Taylor, of Manchester. For a number of years the honourable position of President had been occupied by metropolitan veterinary surgeons, and the provincials now thought it was their turn. His opinion was that the presidential chair should be occupied by a metropolitan and provincial veterinary surgeon alternately. The provincials now numbered some 2,000 as against 200 in the metropolis, and therefore he thought the former had claims upon the office of President which ought to be recognised. Mr. Peter Taylor had been elected two or three times to the Council, and was a most regular attendant at the meetings. He was also at the present time President of an old and influential Veterinary Medical Association, and if he were elected to the chair he thought the action of the Council would be universally approved.

The ballot was then taken, with the result that 13 votes were recorded for Professor Walley, 4 being given in favour of Mr. Peter Taylor. Professor Walley was thereupon declared to be duly elected President.

Election of Vice-Presidents.

The following gentlemen—Messrs. Woods, Lawson, Lambert, Barford, Wilson, Hills, Borthwick, Simonds, Walters, and Dun—were severally proposed by Messrs. Whittle, Cartledge, Simcocks, Simpson, Santy, Axe, McCall, Blakeway, Wragg, and General Sir F. Fitzwygram.

The PRESIDENT having announced that only six of the gentlemen proposed as Vice-Presidents could be elected,

Mr. SIMCOCKS said that before the ballot was taken he wished to move that on the present occasion and in future each nominee should be balloted for separately, so that each gentleman elected should be placed in office by an absolute majority of those present. Hitherto one ballot had decided who should be the Vice-Presidents, and that arrangement precluded an absolute majority of those present being given to each of those elected. At present, if four or five gentlemen combined, and voted only for one or two, they would be able to elect them, notwithstanding that there was not a majority of those present in their favour, and his object was to prevent such a possibility.

General Sir F. FITZWYGRAM questioned very much whether "majority" meant the greater half of those present; it meant the majority of those voting.

By the desire of Mr. GREAVES,

The SECRETARY read the clause of the Charter of 1844 dealing with the election of officers as follows:—"The persons to be appointed President, Vice-Presidents, and Secretary shall be decided by ballot."

Mr. SIMCOCKS said he would withdraw his motion, as it did not seem likely to be accepted by the Council.

This was accordingly done.

The ballot for Vice-Presidents was then taken, with the result that the following six gentlemen were elected:—T. D. Lambert, 14 votes; W. Woods, 11; H. J. Cartwright, 10; J. D. Barford, 9; W. B. Walters, 9; and J. Borthwick, 7.

Election of Treasurer.

On the motion of Professor PRITCHARD, seconded by Professor AXE, Mr. Dray was unanimously re-elected Treasurer.

Mr. DRAY, in acknowledging his reappointment, said he was extremely obliged for the compliment that had been paid him. At the same time he would like to say that he thought the duties of Treasurer should not be merely nominal, but that part of his functions should be to make suggestions to the Council if the necessity arose, and that he should not be deterred from protesting, if he thought the financial position of the College was not satisfactory.

Election of Secretary

Mr. DRAY having had so many opportunities of witnessing the manner in which the Secretary performed his duties, he had not the slightest hesitation in proposing that he be re-elected.

Mr. SIMPSON said that he too was acquainted with the excellent manner in which their Secretary got through his work, and therefore had much pleasure in seconding the motion.

Mr. WHITTLE supported the motion, which was then put and carried unanimously.

The SECRETARY expressed his thanks to the Council for his re-election. He said he had always endeavoured to do his utmost towards furthering the interests of the profession, and would continue to do so. He would also like to thank the President, the Treasurer, and those gentlemen forming the Committees for the assistance they had given him during the year in all matters that he had had to place under their notice.

THE QUARTERLY COUNCIL MEETING.

The following notice of motion by Mr. T. H. SIMCOCKS was on the paper for consideration:—"That the Quarterly Council Meeting for July be held in

Manchester on the same day within the week in which the annual meeting of the National Veterinary Association takes places."

Mr. DRAY said, if he were in order, he would like to give notice of a matter relating to the Secretary, to be considered at another meeting. Since Mr. Hill had been appointed, his duties had doubled, and he had been obliged to get additional assistance, with the consent of the Council. For that additional aid the College had had to pay between £38 and £40, and what he (Mr. Dray) proposed was that Mr. Hill's salary should be raised £50, and that it should be left to his discretion as to when he should obtain the necessary assistance. He should also like to know whether the Committees could not be appointed by a special meeting called before the next quarterly meeting, at which it was usual to appoint Committees. As an illustration of the convenience which would arise from the course he had suggested being pursued, the Finance and Registration Committees would be able to meet and make good progress with the business outstanding.

The PRESIDENT said that as the present meeting was called solely for the purpose of electing officers, he thought it would be desirable that the consideration of Mr. Simcocks' motion and the important matters on which Mr. Dray had spoken should be postponed till the next meeting of the Council.

This proposal meeting the views of the Council, it was adopted, Mr. Simcocks consenting to withdraw his motion.

Mr. DRAY said that before they separated he wished to propose a hearty vote of thanks to their late President for the very diligent and attentive manner in which he had performed his duties. He thought no one had tried to elevate the profession more than Dr. Fleming.

Mr. GREAVES said it was with very great pleasure that he seconded the motion. It had been his lot to sit at the Council for over twenty years, but he did not recollect any President who had been more energetic and more active in his endeavour to serve the profession than Dr. Fleming.

The motion was carried by acclamation.

The CHAIRMAN in acknowledging the compliment said that he received the thanks of the Council with a large amount of satisfaction. He did not know that he had ever passed four years of his life with such feelings of pleasure and pride as he had done during the period he had been President. He hoped much useful work had been done, and he thought that the profession was no worse that day than on the day when he had the honour of being made President. He trusted that the chair would always be filled by men who were heart and soul in the progress of their profession, and that its duties would be fulfilled with energy, enthusiasm, and wisdom. It was a very high honour indeed to any man to become President of the College. He had himself felt the responsibility of the position, and had been aware that no effort on his part, however great, could at all equal the demands made upon him. Much remained to be done in order to place the profession on a proper footing in this country, but he was convinced that if the profession only supported those who had been labouring hard to improve its status, success was certain—nothing could keep them back in their striving for their own elevation. He thanked them very kindly for the support they had given him, for their forbearance, and for the able assistance they had rendered him on every occasion. In conclusion, he could only hope that their future Presidents would have the welfare of the profession as much at heart as he had, and that they would be able to accomplish more good than he had been able to achieve.

The proceedings then terminated.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the County Hotel, Newcastle-on-Tyne, on Friday, May 30th, the President, D. M'Gregor, Esq., Bedlington, in the chair.

There were present:—Messrs. Peele, Durham; Mulvey, Bishop Auckland; Dudgeon, Sunderland; Wm. Hunter, Stephenson, Elphick, Mitchell, A. Hunter, and the Secretary, Newcastle-on-Tyne.

Letters of apology for non-attendance were received from several gentlemen.

The minutes of the previous meeting having been read and confirmed,

Mr. MULVEY opened the discussion on Professor Walley's paper on Hernia (adjourned from the previous meeting), which was carried on in an animated manner by the members present, the President remarking that in a case of Scrotal Hernia in the horse he does not operate by means of the covered operation, but finds by making a very small incision in the scrotum, just large enough to force the testicle through, and then removing the testicle in the ordinary manner, that no ill result follows, and that in no case has he met with protrusion of the intestine as a sequel to castration performed in this manner.

Mr. PEELE condemned the use of the trocar or exploring needle in diagnosing a case of Hernia, and was of opinion that the use of these instruments was likely to be followed by Peritonitis, and stated that by the persistent use of a truss he had been most successful in reducing cases of Umbilical Hernia. He also mentioned that castration by means of the covered operation was not a favourite operation of his, as in many cases he had seen it followed by Tetanus.

Mr. MULVEY exhibited, as a morbid specimen, the scrotum of a calf, which was so large that during the animal's life it touched the ground. A *post-mortem* examination showed that it contained but one testicle, which was properly formed, but enlarged to an enormous extent.

Mr. MULVEY also narrated a very interesting case of Traumatic Carditis caused by a large piece of wire. Many of the members present had met with similar cases, which were stated to be very common in the district, in consequence of the extensive use of wire rope as fencing.

The PRESIDENT said these cases were easily diagnosed, as in every case he met with auscultation revealed a strong pumping sound in the heart.

Mr. MITCHELL said he had found all these cases accompanied by a dropsical condition of the dewlap and throat, and a dicrotic pulse.

Mr. ELPHICK said cases of this kind were of frequent occurrence in his practice, and he also gave particulars of the case of a mare which had for some time been in bad health and not thriving. This animal died suddenly, and on *post-mortem* examination a large needle was found in the liver. The needle had evidently been there some considerable time, and was encased in fibrous tissue.

Mr. W. HUNTER proposed a vote of thanks to the President, which was carried unanimously, and the meeting terminated.

WILLIAM W. SMART,
Hon. Secretary.

IRISH CENTRAL VETERINARY MEDICAL SOCIETY.

THE adjourned meeting of this Society was held at the Royal Dublin Society's rooms on the 24th April, when there was a goodly attendance of members, with some visitors. Mr. W. Pallin (late 20th Hussars), President, in the chair. The minutes of the previous meeting were read and confirmed, and several letters were read by the Secretary from members who, from various causes, were unable to attend. A letter from Veterinary Surgeon H. Sewell, A.V.D., was also read, in which he expressed a wish to resign his membership on account of his being transferred for service in England. Also from Veterinary Surgeon John Gloag, whose health unfortunately prevents him from attending the meetings. The resignations were unanimously accepted, although all present regretted the necessity. A working committee for the annual dinner, which takes place on the Monday in the horse-show week, was then elected, consisting of the President, Mr. T. D. Lambert, Mr. P. A. Lawler, and the Secretary. Some other business details followed, and the worthy President proceeded to deliver his inaugural address :—

Mr. PALLIN said : Gentlemen, It is within a few months of fifteen years since I had the honour of standing at this table to read a paper to the first meeting of the first Veterinary Medical Society formed in Ireland. That society and its meetings are a thing of the past ; and many, I am sorry to say, of the brilliant lights of our profession who sat in these benches that night have passed over to the majority—many of them good and true friends—to be replaced by new aspirants to veterinary fame. Our old friend Time has moved on, and it is no small pleasure and honour, after years of a rambling soldier's life, to find myself, after being half round the world, again at this table—this time as your chosen President for the current year—of the Irish Central Veterinary Medical Society. Small as our profession and young as our Society is, I cannot look back without pride on the progress we have made both as a profession and a society—progress not only in the scientific world, but progress in the commercial and social scale. Few professions have made greater strides during the last twenty years, and where it has not done so it can generally be traced to the apathy of the members themselves, for every day the public are learning to regard us with more importance ; and most men now have their family veterinary surgeon as well as their family doctor or lawyer. There has been no greater enemy to our social success than the want of unity amongst ourselves. The rock on which our first society split was the difficulty to get a few veterinary surgeons who practised in the same town or district to meet each other in friendly discussion, or even speak kindly of each other, and there is still the few who are ready to bicker and stand out alone ; but we have the many who are ready to come forward and cast aside this narrow-minded ignorance, and meet as scientific men, as gentlemen, and as friends. Year after year, as our Society flourishes and prospers (which I have not the least doubt it will), the circle of "outsiders" will narrow itself, and ultimately the public will learn to measure the intelligence of these men, and value them as much as we do. But to make a retrospect of the year just past is usually the duty of your newly-elected President. It has been an eventful year to our profession in the establishment of the Veterinary Surgeons' Act, and which was so long looked forward to as a cure for many professional grievances. In Ireland, however, we have not felt it so keenly as our English or Scotch brethren, where the quack horse-doctor, the horse-shoeing farrier, is more plentiful, and only too ready to dub himself with any title that caught the public the best. Men have often asked me why the species of vulgarity known in England as the "running horse-doctor" was almost unknown in Ireland. I have traced it to an innate

love of the horse, coupled with the natural inclination and power of every Irishman to detect an impostor, in horse matters particularly. In many a long march through England scarcely a village was passed through without seeing the sign of the village "vet.," who, in many instances, added it to the sign of the "White Hart," or the "Jolly Farmer." In places I have interviewed some of those worthies, and found their stock of horse-lore little better than what we find in many a stable-helper. These are the men whom *our* wise Government have taken care of in the late Act, but who, until time expires, will always be the social jar of our profession, and which now represents the noble band designated "existing practitioners." When I tell you how that out of the total number of those registered only twenty existed in Ireland, and very few more applied for the certificate, it will bear out my argument that the "quack" is not a gentleman indigenous to our little island. At the same time I have no doubt many of these persons are held in good esteem, not only by their employers, but by members of the profession, and the college has displayed a wise generosity in allowing them to continue to practise; as they are the last of their race, and as their names will not be added to, they will ultimately become a blank in the register, and the circumstance that they ever existed will in time only remain to mark a momentous turning-point in the history of our profession. Too much thanks cannot be given to those gentlemen who worked so hard for us in so important a matter to our profession, and especially to our best of friends, the President of the Royal College of Veterinary Surgeons, George Fleming. During the past year we have heard a great deal on the subject of the establishment of a veterinary college for Ireland. It has been largely discussed in the papers, has been the subject of a deputation to a Viceroy, who is a true friend of our profession, and has been keenly taken up by the noble society under whose roof we are met—to wit, the Royal Dublin Society. I may boldly assert at once, as one who has the success of our profession in Ireland deeply at heart, and far more, indeed, than many of those would-be directors and promoters of this college scheme, that I would regret the establishing of a licensing power in Ireland which would sever us in the least from the Royal College which now exists, and which, by years of great care and government, is perfect, and which cannot be claimed by England more than by Ireland or Scotland, and can send a section of its board to examine the pupils of any school which is properly constituted. The establishment of a school, well and efficiently managed, under the auspices of the Royal Dublin Society, would be a matter of pride to us all, and I look forward to its taking place at no distant day; but as men who can speak practically and independent of all professional bias, anything which would divide us from the parent tree must weaken us, and the offshoots from it would be weaker still. Some years since the subject of establishing a private veterinary school in Dublin deeply interested me, as at one time—in conjunction with and assisted by a very eminent member of the profession—I seriously thought of the venture; but when I went into the matter, and found the number of Irish students attending the English and Scotch colleges, and allowed for a probable increase of as many more—even taking into account the low fees charged by the colleges—it would not repay the outlay of trouble or capital; while we could not count on students coming from the other side of the water, as they depend on our students going over. It could only be done properly by a large Government grant or by the Royal Dublin Society; and they have given it their fullest consideration, inasmuch as, no later than the 24th February last, a meeting was held to receive a report drawn up by a committee in conformity with a resolution of the society of November 8th, 1883, to report to the Council as to the most effectual means of founding an Irish college or school of veterinary surgery and medicine with

independent powers of examining and of conferring diplomas. The committee, after referring to the Charter of the Royal College of Veterinary Surgeons of 1884, go on to state that this charter applies to the entire United Kingdom of Great Britain and Ireland, so that the power for granting veterinary diplomas in Ireland is vested in the Royal College of Veterinary Surgeons; and if a veterinary college were established in Ireland, there would be little difficulty in arranging with the Royal College of Veterinary Surgeons for holding examinations and granting their diplomas to those who should pass the examinations satisfactorily, the same as Edinburgh or Glasgow. The report then enters into the cost of an institution, in which it is stated that the probable expenditure would be £800 per annum in excess of income, estimating the students' fees at £500. In conclusion, the report states—"Finally, however desirable it may be to secure for Ireland proper facilities for veterinary instruction, the Royal Dublin Society ought not to undertake such a task, as it cannot with propriety adopt the most effectual means for attaining the object in view." On the other hand, the society might very well aid an Irish Veterinary College in the same way as the Royal Agricultural Society of England, and the Highland and Agricultural Society of Scotland aid the English and Scottish Veterinary Colleges—*i.e.*, by grants in aid and the offering of prizes to be competed for by students. There are few matters of more importance to us than the question of veterinary education, and those who peruse our journals must have been struck with the number of different opinions ventilated on the question by eminent members of our profession on the subject. The College can make laws and the schools lay down codes, but for years I have held the necessity of the "Apprenticeship Clause," and, as stated in the annual report of the College this year, "that a very great proportion of the profession and nearly the entire Council were in favour of such powers being obtained, as the necessity for students obtaining a practical knowledge of their profession is becoming every year more urgent." This knowledge the veterinary schools cannot adequately impart, as clinical and surgical instruction with regard to the domesticated animals is almost impossible, because of the absence of facilities. My experience has been, *that most of the men whom I have met who made their mark in the profession, had passed through this ordeal, and received their early training in the sick-box of the practitioner.* On the other hand, there are men who will argue that many young men's lives have been unfavourably moulded by the associates met with during their pupilage. True, I have known instances; but most of them would have turned out badly, and been useless no matter how they were educated. The early hints in the sick-box or when often, perhaps, there is a little responsibility by coming in contact with cases alone, imprint themselves deeper on the memory than far more important cases afterwards. I can call to mind now vividly many of the cases during my pupilage, and they have often and often cropped up as most useful references when I came afterwards to study the histology or pathology under competent teachers—while little mistakes made (and such are common to us all) are marked for ever on our mind at that time, and carefully avoided afterwards. Some of the most helpless exhibitions of veterinary education I have seen in the army. Men who could not earn a sovereign a month in public practice have managed to get into the service; many of them who never saw a horse get a ball, unless in the distance in college, have been appointed to cavalry regiments, amongst men who already know a good deal about horses. The result is that before a month had passed over their brother officers found the "new vet." knew little of his profession, and all confidence was lost in him. Now, most of those I have traced to men who went to college just as a means of getting a commission, and despised to have an early training from a properly-qualified veterinary surgeon. In private life those men would soon

XUM

find their practice, if they ever got any, desert them; but in the army they move from regiment to regiment or station to station, wishing only for the day when they may claim their pension. The day, however, I am glad to say, for men of this class to enter the service is past, for at its head we have a practical, educated gentleman, the most distinguished veterinarian of the age, who will admit none but those who are practically, theoretically, and socially fitted for the valuable and important appointments in the army. In making a sweeping statement like this, I do not mean for a moment that there are not some brilliant members of our profession who never served a day's pupilage, but I maintain they are the exception too often to the rule, and I shall always consider that a few years in a good practice with a proper preceptor are worth half a college education towards success in the battle of life afterwards. Nature, too, in her wise dispensation, helps to make a good many successful veterinary surgeons. An innate love of animal life, a quick perception, a straightforward character with moderate education, seldom fail to make a successful practitioner. And now, gentlemen, there is one point which I am deeply interested in, and it is this—that although we have sent our worthy colleague, Mr. Simcocks, to the Council of the Royal College of Veterinary Surgeons, the entire Irish vote, as I may call it, should not be placed on his shoulders; I would like to see the number of the present Council increased, and on its roll three or four of our eminent Irish practitioners. The London men monopolise it as a kind of "Home rule," but I am sure we can nominate one or two men from our society who will not grudge, in the interests of our profession, to make a trip to London two or three times a year, and assist in the government at Red Lion Square, and especially as I hope to see our present excellent councilman promoted to one of the vice-presidents' chairs at no distant meeting of the College. And now, in conclusion, a word for our society. Like any young venture, we cannot expect it to bloom forth in a year or two into full vigour. There are, however, names enrolled amongst its members which could make any association a success if they but give a little help. We have materials *ad libitum*. We want united action. I can quite understand how difficult it is for men who are in hard-worked daily practice to sit down and write a long scientific paper for us. But I would urge on each member to note the cases of interest between each meeting, and give us a short account of them—even a few notes will give us the nucleus for a discussion, and often more benefit is to be derived from it than a long-winded scientific peroration, which took weeks to work up. Be assured the public are good judges, and are pleased to see their veterinary surgeons taking an active part in the promotion and advancement of the science which they have selected as their avocation. I am proud, indeed, of the position you have placed me in as your president, and it shall not be for want of energy that I shall hand down the trust you have placed in me untarnished. I am proud to be assisted by vice-presidents of practical merit and professional standing, while with a secretary second to none, there is little fear of our barque being safely piloted through the coming year. May it be a prosperous one to each of us, and may the roll-call at the end be free from the dark cloud which overshadowed it last year in the loss of one of our best friends, Laurence Hunter, who, had he been spared, would justly have occupied the chair in which you have so kindly placed me for the year. His memory will, however, live green in the annals of this society as one of the foremost amongst its members, from its foundation until his death. Our society is launched on the third year of its life, and its success, as I have said, depends on individual help. We want more than formal attendance. Let each bring his mite of information and share it freely with us. Our profession is rich in interest—our patients present daily-varying symptoms—our ever-changing

climate and temperature bringing about pathological changes, which are often more marked in one district than in another. Though last year we had not so many papers as I would have wished, still I count on several important ones for this year. The motto of our profession should be fully borne out by our society, and let the success of it be in our union and strength.

The address was listened to with marked attention by all present, and at its close, a cordial vote of thanks to Mr. Pallin for the sound, practical way in which he had dealt with his subjects, was proposed by Mr. W. C. JOSEPH. This was seconded by Mr. G. B. MILLER, Government Veterinary Surgeon, Dublin, who took the opportunity of making some very cogent remarks on the Council representation of the profession in Ireland, and the desirability of its being extended.

The vote was carried by acclamation, and Mr. PALLIN, in acknowledging the compliment, took occasion to refer to Mr. Miller's remarks, and strongly endorsed them; at the same time advocating the absolute necessity of at least one or two other representatives in the Council from Ireland, inasmuch as this would ensure the attendance of one member at all times at the meetings of the Council, and he strongly enjoined the society to use its efforts next year to return at least two other "members for Ireland;" and with a view of being properly prepared, that the subject should be formally discussed at the last meeting of the year 1884.

Mr. M. HEDLEY then moved that the president be asked to allow his address to appear in the VETERINARY JOURNAL. This was seconded by the SECRETARY, and passed unanimously, the president assenting. The meeting separated.

J. J. SPERRING, F.R.C.V.S.,
Hon. Sec.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the Blackfriars Hotel, Manchester, April 16th, 1884. Present:—Peter Taylor, Esq., the President, in the chair, and with him Messrs. Thos. Greaves, Geo. Morgan, Wm. Woods, Wm. Whittle, T. Hopkin, E. Faulkner, S. Locke, W. Leather, H. C. Harrison, T. B. Cockshoot, T. Briggs, C. W. Ingram, and J. B. Wolstenholme, members; also visitors, Messrs. C. Phillips, Hulme, Marriott, and French.

The minutes of the last meeting were read and confirmed. The letters regretting inability to attend were laid before the members.

The SECRETARY then brought forward the illuminated letter of condolence with Miss Taylor, prepared in accordance with the resolution of December 12th last. It was approved of, and the President and Secretary were requested to convey the same to Miss Taylor.

Mr. WHITTLE then referred to the long and valued services which Mr. Greaves had rendered this Association and the profession in the Council R.C.V.S.; and as his term of office was expiring, moved that the very best thanks of this Association be given to him. This was seconded by Mr. W. WOODS, and carried unanimously.

Mr. GREAVES replied, thanking the members for the confidence they reposed in him, and assured the Association that his best efforts were always at their command.

The PRESIDENT announced the death of Mr. Cuthbert Simpson, M.R.C.V.S., of Manchester, who, though not lately a member of this Association, was a warm supporter at its commencement. Mr. Simpson was one of the oldest veterinary surgeons in the city, a very hard worker, and a warm friend.

Mr. TAYLOR moved that an illuminated letter of condolence be sent to

Mrs. and Miss Simpson. This was seconded by Mr. GREAVES, and carried unanimously. Mr. T. Briggs was entrusted with carrying out this resolution.

Mr. GREAVES then opened the adjourned discussion upon Glanders by reading a paper. He took up the position that Glanders did not, and could not arise spontaneously, but that the morbid process was the result of the introduction of a specific poison or distinct microbe; that no more could wheat or oats spring from the ground, except from the seed of a former like plant, than Glanders or Farcy develop but from the poison of the same pre-existing disease. Mr. Greaves went on to describe the various modifications of Glanders, and the conditions tending thereto as to individual susceptibility, age, food, work, and sanitary surroundings. Mr. Greaves also cited cases, and gave very interesting details of experiments he had made by inoculating a cow with glanderous matter, which, however, had had a negative result. Mr. Greaves then pointed out the prophylactic measures to be adopted, and the best modes of disinfection.

The paper was long and very practical, and evoked the praise of the succeeding speakers.

Messrs. P. Taylor, Geo. Morgan, W. Woods, T. Hopkin, C. Phillips, T. Briggs, W. Leather, E. Faulkner, W. Whittle, S. Locke, and the Secretary joined in the discussion, and Mr. Greaves replied.

On the motion of Mr. T. BRIGGS, seconded by Mr. S. LOCKE, a vote of thanks was accorded to Mr. Greaves for his valuable paper.

JNO. B. WOLSTENHOLME, *Hon. Sec.*

THE MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 448, *vol. xviii.*)

Docking sheep, under certain circumstances, is necessary for health and economical reasons, which do not apply in the case of horses—as for the prevention of maggot; and yet this prevention cannot always be secured by docking, as maggots are often found eating into the sides of sheep which have been docked, and this operation consequently does not diminish the care necessary on the part of the shepherd during the "fly season."

The fact of many surgical operations being necessary, does not excuse those which are unnecessary, and the tendency of civilization is to diminish pain and suffering, whether in man or beast.

I am more than astonished at the argument with regard to emasculation. Does Mr. Stanley really mean that the all-wise Creator placed the human testicles outside the body only in order that they might easily be removed, for the purpose of supplying eunuchs as servants to barbarians, who are jealous of their wives? Eunuchs are no more necessary than the slaves which, till lately, were employed in America and in our own Colonies. Every form of abominable cruelty or injustice might be sanctioned and perpetrated on the ground of being "necessary to the welfare and convenience of mankind." Are eunuchs necessary to the welfare or convenience of mankind? Mr. Stanley forgets that the all-wise Creator has not placed the testicles of all creatures outside the abdominal walls, in order that they might be easily removed. In the elephant, for instance, they are situated deep in the abdominal cavity (sub-lumbar region), and are so difficult of access that castration of this animal is considered an impossible operation. And yet this is a most useful domesticated animal, whose value is sometimes much impaired (as when in "must,") because it cannot be emasculated.

I might ask if an all-wise Creator placed horse's tails where they now are,

merely in order that horse-dealers, breeders, farriers, and veterinary surgeons might lop them off conveniently?

If we are to believe in the designs of Providence, no organ is bestowed unless for some useful purpose, and the horse's tail is given to complete and enhance the beauty of a beautiful animal, as well as for protection or defence, and, in a measure, to aid in locomotion.

My views with regard to the use of tails of animals differ from those of Mr. Stanley. The tail of the crocodile is not only useful in the water, but also on the land, where it is a most powerful weapon of offence and defence. With his tail the crocodile has been known to knock over a tiger. Consider the tail of the kangaroo! what a potent instrument it is in progression, and even in defence! In certain tribes of monkeys, the tail plays the part of a fifth limb during locomotion, supporting the entire weight of the body, and preventing this from falling during the arboreal movements of these creatures; and so with many other kinds of animals.

The fact of a tail or limb diminishing in size, by no means proves that it is useless, or about to disappear, as it may be more useful in a small than in a large form. The smaller digital extremities of oxen, swine, and deer, are particularly useful in preventing them sinking deeply in mud or snow, and yet they do not interfere with their speed. If certain species of animals have not a tail, it is because for certain reasons they do not require one, or some other provision is made for the absence of this organ.

The cow's tail is not such a feeble organ as Mr. Stanley represents it to be. Those who have had much to do with cattle can testify that a switch from it is not pleasant, and if the cow's tail does not always protect it from the gad-fly, it is either because this eludes the tail or (which is most frequently the the case) it attacks parts which the tail does not reach.

Horses in India would be driven mad if deprived of their tails during the fly season, and short-docked horses in this country show the misery and annoyance they suffer when they cannot brush away the flies from their flanks or hind-quarters. That the horse's tail is not a rudimentary appendage is evident from its strength and development, for in proportion as these are increased, so is the vigour of the horse. This is a fact known to all horsemen.

To sum up, I and many others who have given the subject close attention for very many years, have come to the conclusion that the horse's tail or dock is a most useful appendage, and should not be mutilated for the mere sake of fashion, and that veterinary surgeons who dock horses for mere fashion's sake are not only pandering to a depraved taste, but are guilty of cruelty, inasmuch as they are inflicting unnecessary pain: the operation being painful under any circumstances, and extremely so when performed as some veterinary surgeons perform it. The operation is not unfrequently attended with most serious results.

Not many years ago, nicking was supposed to be as useful as docking now is, and veterinary surgeons regularly performed the operation. I have also known veterinary surgeons crop dogs' ears and tails. These were fashionable operations, and veterinary surgeons practised them for pecuniary gain.

No one more than myself maintains the necessity for performing operations upon animals which relieve these from pain, or make them more useful to man; and I have come to the conclusion that docking is a useless and cruel operation when performed for fashion's sake, from an experience of more than thirty years among horses in various parts of the world, and from observation of docked and non-docked animals. Not an argument yet advanced in favour of docking, as it is now promiscuously practised on all kinds of horses, which have neither diseased nor deformed tails, can stand against those arguments which are opposed to docking.

I may add that, acting on my belief, I have consistently and persistently refused to dock horses, when the tails were not diseased or deformed, and I have never owned a docked horse, though I have ridden and driven horses all my life."

Mr. GREAVES, after the reading of Mr. Fleming's paper, continued the discussion. He said he had been at Liverpool and Yorkshire, where this question was discussed; where the question of cruelty arose appeared to be in searing, but if they omitted that in operating no cruelty arose. Many of them knew that Professor Pritchard and Mr. Fleming went down to Carmarthen and gave evidence against a veterinary surgeon for the torture he had inflicted upon a horse. It was because there were mal-practices on many occasions that Professor Pritchard took the course he had done. In the case of the Carmarthen surgeon, it was proved that he had acted in a most barbarous manner, the horse being burnt nearly to the bone to stop the bleeding. Any man, whether he be a veterinary surgeon or not, guilty of such a practice without feeling or sense, is deserving of some punishment; although he (Mr. Greaves) had said that he would not go into the witness-box against a veterinary surgeon for docking horses; he could show cases such as that which occurred at Carmarthen that deserved punishment. There was another question to be brought forward, and that was in reference to persons who, though not being registered practitioners, still treated horses. There was the common blacksmith; was he entitled to the same consideration? (No.) If the operation could be performed by the blacksmith quite as effectually as by the professional man, would you object? (A member: In nine cases out of ten the common blacksmith has not proper instruments.)

Mr. COX said that Mr. Greaves had characterised the subject as being of vast importance. They had Dr. Fleming, Professor Pritchard, and in addition the Royal Society for the Prevention of Cruelty to Animals. They had on the other side, Professor Williams and the greater bulk of the profession. There were thousands of horses docked for no reasonable purpose whatever. There was no doubt that the wholesale cruelties which now went on throughout the country, and especially in Yorkshire, should be put a stop to. Even if docking should be under the cognizance of a properly qualified man, there was no great anatomical skill required in taking off the end of a horse's tail, so long as they knew where the joint was. A blacksmith or a registered practitioner was really qualified to execute the operation. Dr. Fleming had pointed out that in the service the horses were not docked, and they did not find that they worked any the worse. To his mind, the question was one of taste. So long as the public believed in docking, it would not be discontinued; but when they got the public to believe in a graceful flowing tail, docking would disappear. Docking might be absolutely necessary in the case of harness-horses, but to cut the tail off too close was simply absurd. If the carriage could not be made to fit the horse, then they ought to do away with their carriage-builders. He did not believe that horses were not sensitive. He had seen horses in most dreadful pain, though they had been attended to in the most scientific manner. And there were instances where permanent lameness was caused by docking. Although in some instances it might be necessary to adopt this operation, yet the wholesale and indiscriminate manner in which blacksmiths and dealers, especially in Yorkshire, carried on the operation in the most barbarous manner, was to be condemned.

Mr. MEEK said as far as army horses were concerned, the question of cruelty did not come in, because he would remind the meeting that the veterinary surgeons in the army were paid by salary instead of fees; and if that was not the case, perhaps there would be more horses docked. He had seen and read Mr. Fleming's paper, but there was nothing in it that led him to believe that docking was an act of cruelty; he could not help thinking that

the veterinary surgeons of the country had been subjected to a good deal of persecution. Why did not those persons who were so anxious with regard to the question of cruelty to animals, swoop down on the talented professors? He thought that some discretion should be used by the stars of the profession before they swooped upon little men.

Mr. OLVER said that he did not agree with the indiscriminate docking of horses; that should be left to a great extent with professional men. According to Dr. Fleming's paper, he says that with regard to driving-horses, it is unnecessary to have them docked. Whether the tail of a horse was inordinately sensitive or not was a matter of dispute. In docking, he would use simply a "plug," but at the same time he agreed that "searing" should not be carried out. As to the Royal Society for the Prevention of Cruelty to Animals he supposed they would want to know what their affections were for dumb animals. He would give them an instance. He was asked the other week to take off the claws of a dog. This he did, but he put the dog under chloroform the while. There was the question of docking lambs' tails, which came to precisely the same thing. Then there were other cases of a similar nature to docking, and which the Royal Society might object to. It might be asked, Were they justified in drawing teeth? which certainly must cause some pain. Then Dr. Fleming said that in the army they would not have docked horses, and then he goes on to speak of long tails as a purpose of brushing off flies. If so, why have their tails cut at all? He agreed that in the majority of cases where the horses were turned into the field from the stable, docking was not necessary; but in the case of carriage-horses, a long tail would not at all be a desirable thing. He thought that some resolution should be submitted from that meeting. With reference to the question of docking, in general he denied that the profession made any profit—in fact, he thought they were not a penny the better for it.

Captain RUSSELL said he looked upon the subject of great importance, not only to the profession but the public generally. They had heard a paper from Mr. Stanley, but he would remind the meeting that the profession advocated docking only when necessary. He thought the question as to the operation of docking should be left to the veterinary surgeon. They certainly did not want the interference of the Society for the Prevention of Cruelty to Animals. They would next have the Society trying to get rid of spaying in the case of pigs. It was far more cruel than to cut off the end of a horse's tail. They were told that horses were not docked in the army. Why? Because in time of peace it was known that the army was not in want of many horses, and another reason was, that the officers of the regiment liked the tails of the horses to be of one uniform length; but if a war broke out it must be remembered that they would be just as glad to buy docked horses. It was said that the harness-horses ought not to be docked; but they were all acquainted with the uncomfortable situation which was experienced in driving horses that were not docked. He moved that the members of this association are of opinion that the docking of horses is a necessary and useful operation, when properly and scientifically performed. He thought it was essentially necessary that the profession should resist the encroachment of unqualified persons, such as blacksmiths, performing the operation of "docking," and that a bye-law to that effect should be drawn up. The docking of horses was only cruel when it was wantonly and needlessly performed.

Mr. COX, as an amendment, proposed that "The wholesale docking of horses now going on be discontinued, and should be applicable only when absolutely necessary."

Resolutions carried unanimously.

Proposed by Captain RUSSELL, seconded by Mr. BARLING, "That the

members of this Association are of opinion that docking of horses is a necessary and useful operation, to be properly and scientifically performed."

Proposed by Mr. OLVER, seconded by Mr. GREEN, "That the members of this Association are of opinion that docking is not cruelty in the ordinary acceptation of that word, when properly performed."

Proposed by Mr. WIGGINS, seconded by Mr. MEEK, "That the members of this Association protest against the measures taken by the Royal Society for the Prevention of Cruelty to Animals, of prosecuting veterinary surgeons, as a means of preventing docking of horses, when properly performed."

Proposed by Mr. TRIGGER, seconded by Mr. CARTWRIGHT, "That the views and resolutions of this Association be forwarded to the Secretary, R.C.V.S., with the request that it be laid before the President and Council at their next meeting."

Proposed by Mr. W. CARLESS, seconded by Mr. HILLS, "That Mr. Simpson's motion on docking horses be brought before the Council of the R.C.V.S., and has the approval of this Association and its sympathy and support."

Proposed by Mr. COX, seconded by Captain RUSSELL, "That in the opinion of this meeting it is desirable that the indiscriminate docking of horses which now goes on, should be curtailed, and be applicable only when necessary."

Mr. BLAKEWAY proposed a vote of thanks to Mr. Cox for the able paper which he had read at the last meeting.

Mr. WIGGINS seconded the motion, which was carried with enthusiasm.

Mr. MEEK proposed a vote of thanks to Mr. Stanley for his able paper.

Mr. SMITH seconded the proposition, which was carried with enthusiasm.

A vote of thanks was accorded to the President for his services in the chair; carried unanimously.

Mr. COX and Messrs. STANLEY returned thanks for the compliments.

Gloucester was fixed upon as the next place of meeting.

The members then adjourned to dinner, when a very pleasant evening was spent.

ROYAL AGRICULTURAL SOCIETY.

AT the monthly Council meeting, held on June 4th, General Viscount Bridport reported that the Committee, having carefully considered a scheme sent by Mr. Algernon Turnor for the purchase for breeding purposes of mares which have been used in the army, they were of opinion that his suggestion was beyond the scope of the Society's functions. They, therefore, recommended that Mr. Turnor's paper be returned to him, with a suggestion that he should submit his scheme to the Secretary of State for War. The Committee had received a suggestion from Mr. Dowdeswell for a grant to enable him to undertake investigations into Black Quarter and allied diseases, but they were not at present prepared to recommend a grant for the purpose. A proposal having been received from Professor Brown that the Royal Agricultural Society should appoint a district veterinary surgeon in each county, or where a county is divided, as in Yorkshire and Lincolnshire, in each part thereof, with a view of carrying into effect the scheme suggested in his paper on the Domestic Veterinary Treatment of the Animals of the Farm, the Committee recommended that this extension of the present scheme of appointing district veterinary surgeons be adopted, and that Professor Brown be asked to draw up a list of names for consideration. Half-yearly reports from provincial veterinary surgeons had been received by the Committee. The Committee had had under their consideration a proposal by a firm of veterinary medicine vendors to issue a Medicine Chest as recommended by Professor Brown in his recent paper in the *Journal*: and they recommended that the Council should require that firm, both on behalf of the Society as well as on Professor Brown's behalf, not to refer in any way, or through any medium,

whether by advertisement or otherwise, to the Society's *Journal*, or to Professor Brown; also that the Society should decline to furnish them with copies of Professor Brown's paper on any terms. The public should be informed that no cattle medicine manufacturers had been authorised by the Society, or by Professor Brown, to sell a Medicine Chest containing the remedies named in the list at the end of his article; in fact, some of the remedies named could not be sold to the public without subjecting the buyers as well as the sellers to penalties under the Poisons Act.

This report was adopted.

Obituary.

THE death is reported of Philip Rock, M.R.C.V.S., of Chelsfield, Kent, who graduated in 1835; and John Corbett, M.R.C.V.S., of Simonburn, a graduate of 1826.

Frederick W. Going, M.R.C.V.S., First Class Army Veterinary Surgeon, died from an over-dose of opium on May 25th, in Madras.

Army Veterinary Department.

Gazette, May 27th.

THE appointment as Veterinary Surgeon on probation of Frank Joslen, gent., is post-dated to May 9th.

Gazette, June 3rd.

Veterinary Surgeon A. Baird resigns his commission.

Gazette, June 6th.

Yeomanry Cavalry, Yorkshire Hussars: G. T. Pickering, gent., to be Veterinary Surgeon.

Gazette, June 10th.

Harrie Malcolm Maxwell, gent., to be Veterinary Surgeon on probation.

Gazette, June 20th.

Veterinary Surgeon William Gladstone to be First Class Veterinary Surgeon.

The Annual Dinner of the Army Veterinary Department took place at the Holborn Restaurant on June 13th. The following officers were present:—

Dr. Fleming (Principal), Messrs. Lambert, Walters (Inspectors), Sewell, Appleton, Walker, Burt, Rostron, Oliver, Reilly, J., Dwyer, Pallin, S. L., Gillard, Elphick, Whitfield, Cox, Burton, Crawford, Sartin, Jones (First Class), Spooner, Davis, Pallin, D. C., Dibben, Griffith, Kelly, Fenton, Joslen.

Notes and News.

CROPPING HORSES' EARS.—With regard to this practice, which was at one time as fashionable as the equally absurd and cruel custom of "docking" horses' tails now is, the following is extracted from "A Treatise on the Cavalry and Saddle Horse," published in 1803, the chapter being headed "On Cropping and Foxing." It is there stated: "The only reason that can be assigned for cropping horses is to improve their appearance; and this operation is performed on those particularly that have heavy ears, or what are commonly called sow-ears. But, as many people crop their horses from caprice only, be their ears ever so handsome, it is necessary, with deference to the better judgment of others, to point out what horses the cropping of would become, as well as the form in which the ears ought to be cropped to show the neck and head to advantage, and to improve the general appearance

of the horse. If a heavy-eared horse be badly formed about the neck, cropping will not improve, but, on the contrary, disfigure him. If he has a fine, regularly curved neck, rising gradually from the withers to the crest, and terminating boldly at the ears, cropping will greatly improve him, and the closer it is performed the better; therefore it is preferable, on the whole, to leave his ears as nature formed them. A short-backed, compact horse, of good courage, and his neck formed as above, will look exceedingly well if he be cropped, and will have a very bold and warlike appearance; but that this effect may be produced by the operation of cropping, it must be done in a particular manner. In cropping horses, those who perform it affect to give the ears the appearance of natural ones by pointing them at the top; and from the resemblance they bear to foxes' ears, it is called 'foxing.' But this has not the effect of giving the animal a bold, courageous look, so much as if the ears were quite rounded at top; that is, when the ears are cut right across, and rather close, and the corners rounded off, instead of being carried to a point." Nearly every horse had his ears cropped in those days, and, with cropping, the tail was nicked and docked. An animal which had suffered this triple mutilation was said by French horsemen to be completely *Anglaisé*, or *mis a l'Anglaise*—a very questionable compliment to English horsemen.

THE INTERNATIONAL HEALTH EXHIBITION.—Dr. Fleming, Principal Veterinary Surgeon to the Army, has been selected by His Royal Highness the Prince of Wales to serve as a juror in Group I., Class VI., Chemistry and Physiology of Food and Drink, Diseases Due to Unwholesome and Improper Food, and Practical Dietetics.

CONTAGIOUS DISEASES OF ANIMALS IN LONDON.—The number of cattle in London affected with Pleuro-pneumonia slaughtered in the years 1879, 1880, 1881, and 1882 was 570, 378, 300, and 259 respectively, whilst in the year 1883 the number decreased to 132. This satisfactory result is, says the annual report of the Metropolitan Board of Works, doubtless, partly to be attributed to the isolation of fresh stock, a practice which many of the more intelligent cow-keepers now adopt, and partly to the much better condition in which the cowsheds in the metropolis are now kept.

The following are the details of the outbreaks of Foot-and-Mouth Disease in London in 1883, including the animals remaining affected on the 31st December, 1882:—Number of premises affected, 119; animals on affected premises, 2,748; animals affected, 1,503; affected animals recovered, 1,414; affected animals slaughtered, 53; affected animals died, 5; remaining affected on December 31st, 1883, 31. The number of diseased animals found in the Metropolitan Cattle Market during the year was 693. Of the cases of disease at the Cattle Market, 114 occurred in January, 310 in February, 3 in March, 3 in April, 13 in May, 9 in August, 38 in September, 37 in October, 49 in November, and 117 in December. The whole of these animals were seized by the market inspector, and slaughtered in the market under his supervision.

Six outbreaks of Swine Fever occurred in London in 1883. The number of pigs in these places was 115, of which 28 died of the disease, 68 were found diseased, and slaughtered, and their carcases destroyed, and the remaining 19 animals continued healthy. In three cases the entire stock was destroyed. The value placed on the 68 animals slaughtered by the Board's direction, and on 9 which died before the order for slaughter could be carried out, was £143 17s., and the compensation awarded, £69 13s. 6d.

HOUSE OF COMMONS.—General Sir F. Fitzwygram, Bart., has been elected to represent South Hants in Parliament.

SUPPOSED OUTBREAK OF MALIGNANT PUSTULE IN CHILI.—According to the *South American Journal*, of May 8th, an alarming disease, called the

"Picada," is reported to be making serious ravages in Chili, attacking with virulent and fatal effects both man and beast. It appears to have first affected the cattle, and afterwards extended its contagion to human subjects. It is described by the *Chilian Times* as "a sort of malignant pustule," and is said to be exceedingly contagious. The disease is attributed to the animals drinking stagnant water, rendered tepid by the fierce rays of the summer sun.

HORSES IN THE BRITISH ARMY.—In the establishment of the Regular and Auxiliary Forces for 1884-5, we find that the total number of horses in the Household Cavalry Brigade is 1,302. The Cavalry of the Line—the twenty-eight regiments of Dragoons, Lancers, and Hussars, and the depots, Staff of Cavalry Depot and Mounted Police, are down for 15,420 troop horses. The Royal Artillery have 10,902 horses; the Departmental Corps, 1,100. The total establishment of horses is 23,210.

Correspondence.

PARTURIENT APOPLEXY IN CATTLE; COMMONLY KNOWN AS "MILK FEVER."

DEAR SIR,—In your issue for the current month, I notice Mr. Pottie delivered an address before the quarterly meeting of the West of Scotland Veterinary Medical Association on the above subject, in contradiction to the theories advocated by Mr. J. R. Cox, which have previously appeared in print. As I was present at Birmingham, and took part in the discussion his paper elicited, perhaps you will allow me space to offer the few following remarks. The actual cause of so-called Parturient Apoplexy, or Milk Fever, being at present shrouded in mystery, of course the various opinions already advanced are merely theories wanting proof, and therefore one theory may be as good as another, and certainly should be allowed fair play in criticism. Considering Mr. Pottie's great and varied experience of upwards of a quarter of a century, I am surprised he did not remember this, by exercising a little more judgment in the form of the language he chose to adopt. As I have no doubt Mr. Cox is quite capable to take care of himself, and as I have no desire to enter into a controversy with Mr. Pottie on the subject of his paper, I will content myself by stating that, if Mr. Pottie will read Mr. Cox's paper carefully through, he will find he has misquoted a remark, and thus completely changed the meaning of the whole sentence. At page 406, December number of VETERINARY JOURNAL, from "It is generally conceded" to end of paragraph; on the second line from the top the last word is "*rarely*." Mr. Pottie, at page 450, June number, line ten from the top, makes it "*always*"; so palpable a mistake, I feel sure, will be duly acknowledged. I have given Mr. Cox's *pack* a trial since reading his paper, and can certainly claim in eight cases (*all in shorthorns*) the most happy results. In my opinion five of these cases were *in extremis* when the pack was applied. That it requires watching, I admit, and that may be considered a great drawback, for in my experience I find it is next to impossible to expect an ordinary cowherd to be able to remove or replace the "pack" properly, or to know when it should be discontinued. I have found it quickly induces a profuse perspiration, so excessive that the animal literally "*reeks*," and that, I believe, is what Mr. Cox states it will do. This opinion I gave at the Midland Counties meeting at Birmingham, and my remarks were confirmed by others present.

Yours faithfully,

Grantham, June 17th. BEN. H. RUSSELL, F.R.C.V.S.

CONSTITUENCY REPRESENTATION.

SIR,—In the Annual Report of the Council, and in your pages occasionally, slight reference has been made to a "Memorial from Scotland"—from the three Scotch societies; perhaps, with your permission, a few words as to the purport of that memorial may not be out of place.

Our profession, as a body, bears somewhat the same relation to the Council as the country, as a nation, does to Parliament. The holders of the R.C.V.S. diploma are the voters, the Council chamber may be said to be our House of Commons. Parliament is the representative governing power of the country, the Council of the Royal College of Veterinary Surgeons is the representative governing body of the veterinary profession. The mode of election and representation which has so long commended itself to the common sense and good feeling of the country, and which has so greatly contributed to its advancement and prosperity, might be useful and beneficial to us as a profession.

The scheme embodied in the memorial, and presented to the Council, February, 1883, briefly stated is this:—Make the Council our Parliament, and elect its members by the constituency system. There are thirty-one members of Council; divide England, Scotland, and Ireland into thirty-one constituencies, and give each constituency the power to choose and send its representative to Council.

The following is the sketch of constituencies sent with the memorial (slightly abridged):—

ENGLAND.

Counties.	Practitioners (M.R.C.V.S.) Register, 1882.	Representatives.
1. Northumberland Cumberland Westmoreland Isle of Man	56	1
2. Durham and 3. York	169	2
4 & 5. Lancashire	170	2
6. Cheshire, Shropshire & N. Wales	81	1
7. Hereford Gloucester Monmouth, and South Wales	64	1
8. Stafford Worcester Warwick	98	1
9. Nottingham Derby Leicester Rutland	85	1
10. Lincolnshire	64	1
11. Northampton Huntingdon Cambridge Bedford	49	1
12. Essex Hertford Buckingham Oxford	86	1
13. Norfolk Suffolk	74	1
14, 15. Middlesex	190	2
16. Kent Sussex	77	1
17. Surrey Berkshire	76	1
18. Hampshire Wiltshire Isle of Wight Somerset	80	1
19. Dorset Devon Cornwall	67	1

SCOTLAND.

1. Orkney Caithness Ross Inverness Banff, Aberdeen Kincardine, Forfar	54	1
2. Perth, Fife, Kinross, Clackmannan, Stirling	53	1
3. Midlothian, Linlithgow, Haddington, Peebles, Berwick, Selkirk, Roxburgh	66	1

Counties.	Practitioners (M.R.C.V.S.) Register, 1882.	Representatives.
4. Dumbarton, Renfrew, Lanark	78	1
5. Ayrshire, Dumfries, Kircudbright, Wigton, Argyle, Bute, Island of Islay	50	1
IRELAND	146	3
Royal Veterinary College, London		1
Royal (Dick's) Vet. College, Edinburgh		1
The Glasgow Vet. College.....		1
The New Veterinary College, Edinburgh		1
	1,933	31

This sketch is, of course, only approximate, not a final arrangement. It gives, in round numbers, to the 1,500 practitioners of England 19 representatives, the 300 of Scotland 5, the 150 of Ireland 3, and each veterinary college a seat at the Council Board. Room might also, we think, be found among the constituencies for one or two representatives from the army, the 100 or so army veterinary surgeons electing among themselves their representatives. No mention is made of veterinary medical societies. Their membership varies greatly—the existence even of some of them is precarious. Each, however, might interest itself in the return of the members of its respective districts.

It may be asked, What advantages has this scheme over the present system of election?

1. Each year the Secretary of the R.C.V.S. has had to issue from 1,500 to 2,000 voting papers. Some of these never reach their destination, others are not understood, many are neglected, and the 1,000 or 1,300 which are filled up and returned give the scrutineers at the annual general meeting sufficient work, while withdrawing them from the business of the meeting. The whole system involves an amount of work, expense, and loss of time which, we think, might be lessened.

If the Council, instead of filling up the six annual vacancies by a general vote of the profession, would simply allow six constituencies in rotation to do so, then as each constituency numbers considerably under 100 members only in an extreme case would 600 voting papers be required. Again, if the members of a constituency were unanimous as to the man of their choice there need be no voting for him. If the six constituencies were ready with their own men, the six vacancies would be filled without the issuing of a single voting-paper; and in five years the Council would be filled by men chosen and sent by the members of the profession in all parts of the country—a saving of time and money, less work, and a better result.

2. An assured seat to the representatives of the colleges, and, it may be, of the army. The claims of each teaching school and of the army to permanent representatives—their principals, probably—on the Council will, we think, be admitted. Under the present system, however, these gentlemen have to seek election like private practitioners, and one occasionally fails to find a seat, and we have the anomaly of an unrepresented college or school. The proposed scheme does away with this irregularity.

3. All sections and classes of the profession would be equally, directly, and specially represented in Council. The result of the present system of election is, and has always been, a big majority for the south. *Twenty London and Lancashire practitioners, a few from the provinces, and two or three from Scotland and Ireland, have decided every important Council matter for the last thirty or forty years.* Has this always been for the good of the profession? A little reflection will, we think, show that had Scotland been properly represented at first on the Council and Examining Board, the Highland Society's examinations would never have been resuscitated, the

profession would not have been divided, and the way would have been clear for a Veterinary Surgeons Act five-and-twenty years ago. Pupilage may commend itself to practitioners in the south; how could it be put into general practical operation in many parts of Scotland? No more important duty devolves on the Council than the appointment of the Board of Examiners, yet at last election our southern friends, we are told, did not know the men of Scotland and Ireland, and passed them all over. After 1886 only Fellows can be Councilmen and examiners. The Fellows are few—many young in years and experience; will this arrangement be beneficial? Have these decisions and acts of Council on these and other important matters fairly represented the wishes and desires of the veterinary profession at large? The Royal College of Veterinary Surgeons is our national body, and its Council, like its Examining Board, should surely be in a greater measure than it is a national one—a Council truly representing the profession throughout the three kingdoms. Constituency representation in Council as in Parliament gives this result. Men need not be summoned long distances for trivial matters. An architect's report, a dinner, a student's letter, a quack registration, and all such minor business every-day matters might safely be left to the discretion of a committee north and south of the Tweed. But in the discussion and decision of important matters, of matters deeply concerning the welfare of our body—such as provisions of the Act, the appointment of examiners, the erection or non-erection of college buildings, the pupilage and Fellowship questions, etc., every veterinary surgeon, and all classes of veterinary surgeons, are entitled to make their voice heard, and they will best do so, surely, through men chosen and sent specially by themselves.

The country would never stand a general vote or *plebiscité* by voting-papers from Westminster. The confusion of such a system would render it almost unworkable. A general election, instead of being got over in a day, would entail days, if not weeks of scrutinising, and many a popular city alderman, mine-owner, and manufacturer, wealthy landed proprietor, and such like, *by the force of numbers and locality*, would usurp the seats in the House of Commons, now filled by better men—the representatives of thickly populated and less-favoured parts of the country. The constituency system, with its "territorial arrangement," its "sentimentalism," its "mechanical ideas," its "geographical representation," is, after all, the only system which the common sense and intelligence of the country will tolerate.

But it has been said that constituency representation is foreign to the constitution of the Royal College of Veterinary Surgeons, and cannot be recognised by it. The constitution of the Royal College of Veterinary Surgeons looked on in sorrow when, in body and spirit, it was a sort of appendage to a southern teaching school, but for years was powerless to help itself. It looks on unmoved when Scotland and Ireland are in a decided minority on its Council. And if in a few years the constituency form of election and representation could be grafted into the constitution of the R.C.V.S., the Royal College of Veterinary Surgeons would surely lose nothing, but gain much in strength, fairness, good feeling, and good wishes.

But will our Scotch and Irish friends attend to their duties in Council? The prayer of the memorial is not that constituencies shall send "local representatives," nor that Scotch practitioners shall send six Scotchmen, nor Irishmen three Irish veterinary surgeons; but that thirty-one constituencies be permitted to send thirty-one representatives, from whatever country or district they please.

There are sixty or seventy holders of the R.C.V.S. diploma in the Lothians and adjoining counties. Cannot these men be trusted to find a good man fit for the Council, and send him to it? One of our number would understand us, and, if agreeable, we would give him the preference. Failing that,

for example, we would be delighted to send the President of the North-West of England Association, or one of the speakers at the last annual general meeting, if they would favour us. On the eve of the discussion of any important matter, these gentlemen would be made acquainted with the general feeling and wishes of the members of the district. If our English friend and representative attended to those wishes, and as far as he conscientiously could, tried to advocate and advance them, we would honour and re-elect him. If he did *vice-versâ*, we would dispense with his services at next election. So with the other constituencies. This form of election would tend to make Councilmen careful as to what those at home thought of their votes.

But will all the constituencies find representatives? A vacant seat in the House of Commons is generally soon filled. There will always, as far as we can judge, be suitors for a seat on the Council. Some may not be so regular in attendance as others, but to a meeting of representatives in London, Manchester, Carlisle, or Edinburgh, thirty-one men will surely be found willing and patriotic enough to journey twice or thrice a year to deliberate and decide on matters deeply affecting the interest of the profession to which they belong.

In apologising for the length of this letter, I trust I may not be held guilty of egotism or presumption in the remarks I have made. The memorial was not presented in a captious or fault-finding spirit, but simply and solely as a means for better representation and government. If, sir, constituency representation is wrong in premises, principles, and conclusions, let it be proved so, and discarded. If it is right, and for our benefit, will it not be well to test and bring it gradually into operation? This was our prayer to the Council, to which they turned a deaf ear. The matter rests with the profession at large. I am, sir, yours very truly,

Slateford, 13*th June*, 1884. C. CUNNINGHAM.

CORRECTION.—In the last issue of the Journal, page 458, Mr. Cawdle should have been shown as having passed with "Great Credit."

THE Report of the Border Counties and Scottish Metropolitan Veterinary Medical Societies, sent too late for this month's Journal, and several communications for which space could not be found, will appear in the August number.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from E. M. Davy, London; J. J. Sperring, Dublin; J. A. Nunn, A.V.D., Lahore; F. Smith, A.V.D., Bangalore; R. W. Burke, A.V.D., Cawnpore; A. W. Hill, London; W. Osler, M.D., Montreal; T. Flintoff, A.V.D., Meerut; Professor Walley, Edinburgh; J. B. Wolstenholme, Manchester; R. H. Dyer, Limerick; G. G. Mayor, Kirkham; W Penhale, Barnstaple; C. Cunningham, Slateford; J. Donald, Wigton; B. H. Russell, Grantham; T. H. Lewis, Edinburgh.

BOOKS AND PAMPHLETS: Return (Ireland) for 1883, Contagious Diseases (Animals) Act; *A. Zundel*, Quelques Considérations Economiques sur la Fièvre Aphteuse; *F. Peuch*, Précis de Police Sanitaire; *E. Aureggio*, Recherches sur les Affections Farcino-Morveuses du Cheval et de l'Homme; Nouvelle Ferrure a Glace; *H. Bouley*, La Nature Vivante de la Contagion; *R. Wallace and E. Kinch*, The Natural and Artificial Food of Scotch Hill Sheep; *J. Csokor*, Ueber den feineren Bau der Geflügelpocke; *A. Baranski*, Die Zähmung Unserer Hausthiere.

JOURNALS, ETC.: *National Live Stock Journal; Recueil de Méd. Vétérinaire; Der Hufschmied; Revue Vétérinaire; Journal de Méd. Vétérinaire; Archives Vétérinaire; Der Thierarzt; L'Echo Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Lancet; Animal World; American Veterinary Review; Edinburgh Medical Journal; Annales de Médecine Vétérinaire; La Clinica Veterinaria; Live Stock Journal; Mark Lane Express; British Medical Journal; La Presse Vétérinaire; Repertorium der Thierheilkunde; Medical Press and Circular; Nature; Field; Quarterly Journal of Veterinary Science in India.*

NEWSPAPERS: *Westminster and Lambeth Gazette; Madras Times; County Gentleman; Morning Post; Irish Times; Sporting Gazette; Bombay Gazette; Sou Eastern Gazette.*

-West
eneral
ny im-
eneral
nd and
tiously
e-elect
t elec-
d tend
votes.
in the
far as
be so
res in
ely be
o deli-
ession

guilty
al was
tely as
cy re-
it be
not be
prayer
with

AM.

d have

Medical
which

erring,
Burke,
lintoff,
er; R.
ngham,
burgh.

nimals)
se; *F.*
arcino-
ey, La
d Arti-
flügel-

; *Der*
naire;
und
nburgh
; *Live*
Ettérin-
Field;

County
; *Sou*